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AUTOMATIC PISTOLS

H. B. C. POLLARD

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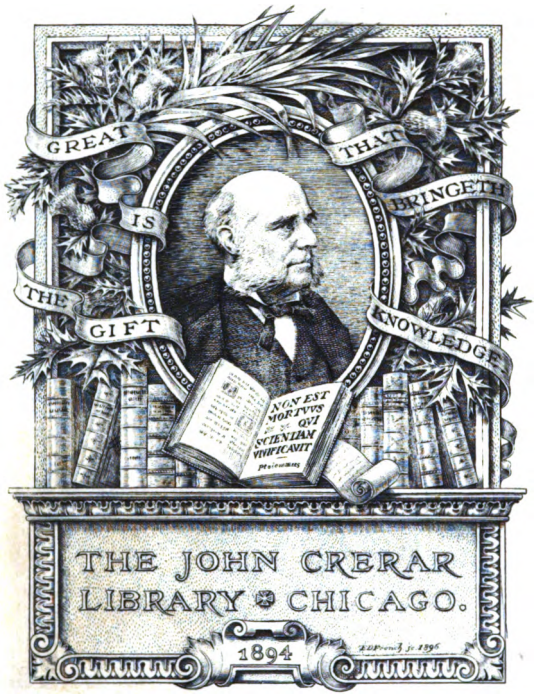
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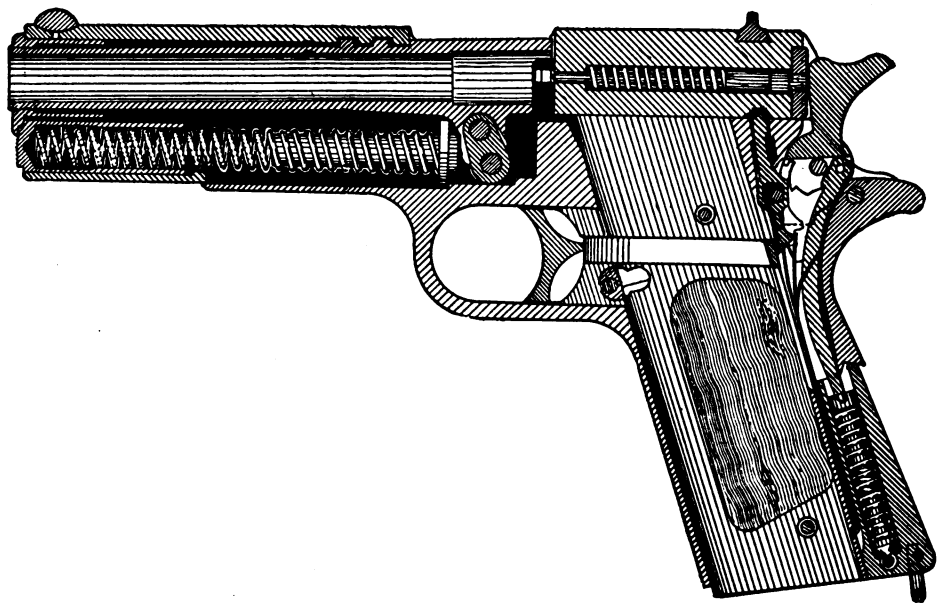

Section of Colt ·45. U.S. Government Model

Frontispiece

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AUTOMATIC PISTOLS

BY

CAPTAIN HUGH B. C. POLLARD
THE LONDON REGIMENT

Author of "The Book of The Pistol and Revolver," "The Story of Ypres," "A Busy Time in Mexico," etc.

LONDON
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PREFACE

THE automatic pistol has been in existence for more than twenty years. It is the arm of the present and the arm of the future, and we may hang up the revolvers in the same limbo of obsolete arms with the percussion pistol and the flint-lock.

Far-sighted collectors are already acquiring specimens of the early automatics and some day these will be as valuable as the early American revolvers which sell to-day for a hundred and more times their original value.

Until now the automatic has been treated as a subsection of the great subject of pistols, but we must admit that war experiences show that the automatic is now coming into its own. Since the armistice new varieties have appeared, others are known to be in contemplation, and a complete new issue of standard ammunition of 7, 8½ and 10 millimetre is projected. Thus, arms that are the latest thing to-day may be obsolescent a year hence—superseded by better weapons.

In the same way the old technique of pistol and revolver shooting founded on military and target shooting rules, will need radical alteration to bring it into line with the modern pistol.

The automatic principle gives a quicker rate of fire, but this is of no value unless the desirability of speed shooting at close ranges becomes part of the essential training of a pistol shot.

Military men, target enthusiasts and all pistol shots must exercise pressure on all shooting authorities with whom they may deal in order to get the basic principle of "quick work with a swift pistol" accepted as the standard of efficiency. Neglect of pistol and revolver

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shooting lost us many valuable lives in the war. There was so much to learn—so many military courses, that training with the officer's one weapon was all too often neglected. We must not slip back into the old lethargy again.

I have endeavoured to bring together in one small volume a general survey of the automatic pistols of the past and of to-day with some discussion of their functions and their failings, and general rudimentary outlines concerning their use.

No book can teach marksmanship, it can only give hints upon what to do and what to avoid—but once the general principles of pistol shooting are grasped, progress based on practice is fairly easy.

There is only one maxim to be remembered and that is the essential nature of all pistols. They are weapons for *quick* use at close quarters.

HUGH POLLARD.

1920.

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AUTOMATIC PISTOLS

CHAPTER I

INTRODUCTION

THE most important development in modern firearms since the invention of the metallic cartridge case and practical breech-loading mechanisms is the *automatic* system.

An automatic weapon is one in which the whole of the work of operating the weapon, that is, the ejecting, cocking, and reloading movements of the arm, is carried out automatically by the discharge of the weapon itself, the individual using it having no other function to perform than aiming, and pressing the trigger for the required number of shots.

There still remains a certain amount of confusion in the public mind about the exact difference between an automatic pistol and a revolver. The latter is a hand-operated arm having a revolving cylinder, which is rotated by mechanism actuated by pulling up the hammer, or by pressing upon the trigger, and it is not worked by the effect of the recoil.

The sole exception to this rule is the now obsolete Webley-Fosberry automatic-revolver, which was really an automatic pistol but was provided with a revolving cylinder on the usual revolver lines.

Another misconception that still exists is that the automatic pistol fires continuously once the trigger has been pressed. This is incorrect, the trigger has to be pressed for each shot as otherwise only the first shot would reach the target, and the remainder would be

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aimlessly scattered owing to discharge taking place when the aim had been lost owing to recoil.

The automatic has now emerged from its experimental and early stages, and is recognized as a sound and reliable weapon, but there are still marked limitations to its development, and it cannot yet be said to have superseded the revolver in reliability, accuracy, durability, or general efficiency of any kind. The chief virtues of automatics are speed of fire, increased magazine capacity, compactness and portability. Here they are undoubtedly ahead of the revolver, but there is much to be done before the *average* automatic is anywhere near so reliable as the average revolver, though already the first-class weapons among the automatics have earned an excellent reputation for themselves.

The usual military automatic can have its magazine reloaded in 20 seconds, the arm cocked and loaded and the magazine replaced in 8 seconds and the eight shots fired in 10·5 seconds. There is only a variation of about 2 seconds between most modern makes, if these operations are performed by an expert accustomed to the arm.

The whole *raison d'être* of a pistol is its efficiency as a *weapon*. It must be reliable when questions of life and death are to be decided, and therefore one's judgment upon the question of "automatics *v.* revolvers" must be based not upon the views of catalogue writers and pistol salesmen, but upon practical experience and common sense. Allowances must be made for service conditions, slight errors in the quality of cartridge, bad design of weapons from a *practical* point of view, and a conclusion reached which will do justice to both makers and users of automatic pistols. It is a serious business when one advises a choice of weapons for personal use, and one cannot afford to be squeamish in saying outspokenly "Such and such is not a reliable weapon. I would not take it," so I say frankly that if an automatic is selected it must be a first-class weapon by a reliable firm.

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The object of this little book is to render accessible details of the most important automatics, some portion of their history, and furnish the reader, be he novice or expert, with some knowledge of these weapons, their advantages and their drawbacks. For a more complete survey of all types of revolvers and pistols I must refer readers to my previous work *The Book of the Pistol.*

AUTOMATIC PISTOLS. The functioning of automatic pistols whose barrel and breech are locked together is a difficult matter to express in easy language, though it can be readily grasped if one has the particular weapon in hand to examine and dismantle.

In small calibre weapons firing a moderate charge the weight of the breech-block, held up against the breech by means of the powerful recoil spring, is quite enough to prevent the breech opening before the bullet has left the barrel.

Theoretically, a charge of powder fired in a "pistol" whose weight is exactly the same as that of the bullet, and which is equally free to move, shoots the bullet as far in one direction as the "pistol" is thrown by the recoil in the opposite direction. In other words, if the weight of the pistol and the ball are equal the impulse given to both pistol and bullet is equal.

In actual practice the weight of the bullet is very many times less than the weight of the breech block, plus the force required to compress the recoil spring. When the cartridge is fired the light bullet possessing less resistance than any other part of the weapon, is therefore driven out by the gas pressure before the same force has had time to overcome the inertia of the heavier breech and spring. This "hesitation" on the part of the force is only momentary—an infinitesimal fraction of a second, but it is sufficient for the bullet to have left the barrel before the breech begins to work. If the cartridge is a very powerful one, or if the barrel

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is very long, some arrangement has to be made that will hold the barrel and breech-block together until the bullet has left the barrel, otherwise the breech would attempt to pull the cartridge out of the chamber while the gas pressure would be binding the brass case to the chamber walls, thus only part of the empty case could be withdrawn, leaving a portion of the case inside, which would jam the weapon.

The ·450 and ·38 Colts and Webleys, the ·380 and ·320 Savages and the Mauser ·301 and Luger-Parabellum pistols all have some such breech locking device.

The smaller weapons nearly all depend upon heavy breech blocks and are on the "blow-back" principle.

The locked breech pistols usually provide for either—

(*a*) the breech and barrel recoiling together in the same plane for a short distance (Parabellum, Mauser, and big Bayard).

or (*b*) The barrel locked to the breech bolt moving up or down on parallel axes to the plane of the bullet's flight during the moment of discharge. The principle of the parallel ruler (Webley and Colt).

The Savage claims a rotary principle of its own (described with the description of the pistol). The same system is more fully employed in the 1916 Steyr.

The Colt locked-breech pistols have their barrel pivoted on links (like a parallel ruler), and the barrel has locking ribs on the top. When the breech slide comes forward, carrying a cartridge in from the magazine, the bolt pushes the rear end of the barrel, so that it swings up and forward on its link hinges. The ribs on its top interlock with ribs inside the top of the slide, so that in its forward position barrel and slide are locked together.

In the Webley locked-breech models, the squared sides of the barrel have inclined planes milled upon them, which secure the barrel to the frame. As the action closes, the pressure of the bolt lifts this barrel, which

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is free to move upon its planes in the slots, and raises it into engagement with the breech-block slide.

In the Luger-Parabellum the barrel and breech-block recoil after firing as one piece, until the projections of the toggle joint in the breech bolt are lifted by the curved incline on the frame which bends the "knee" of the toggle joint, causing its front arm to pull back the breech-block, and its rear or fixed arm to compress the recoil spring which is engaged with a hook lever hanging from its centre. The firing spring and striker are contained in the breech-block and are compressed by the first upward retracting movement of the front arm of the toggle. The return movement is accomplished by the compressed spiral recoil spring in the butt which pulls down the toggle, straightening out the knee and locking the bolt and barrel together again.

A simple way of following this involved process is to take one's own leg as an example—

With the knee straight, the whole leg is rigid. This is the firing position. When fired the cartridge presses against the breech-block (toe of the foot) and drives the whole body (the slide) still rigid, back a certain distance till something gives you a knock under the knee (the curves on the frame that lift the toggle extension knobs), then the foot is free to move back as the knee lifts. The forward toggle arm (leg) is hinged (ankle) to the top of the breech bolt so that the foot (breech block) is free to move parallel in the slide (sole of foot slides along floor). The short arm of the toggle (thigh) compresses the recoil spring which in turn reverses all the processes and straightens the whole toggle out again.

The old model Mauser and the Bayard (service model) both have a system by which barrel and breech recoil locked together for a short distance till the locking member is intercepted by guides and the breech bolt freed to recoil alone.

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CHAPTER II

HISTORICAL DEVELOPMENT

THE drawback to the revolver system has always been the escape of gas and consequent loss of power, between the face of the revolving cylinder and the breech of the barrel. Early inventors tried to overcome this by means of ingenious mechanisms which did away with the revolving chambers: such devices were the various four-barrelled pistols, such as Sharp's, Elliot's, and Lancaster's patents, and a variety of ingenious lever mechanisms similar to repeating rifle devices, such as "Henry's Volcanic Pistol."

None of these were satisfactory, the lever devices had too much work to do, and required too much force, the four-barrelled pieces were heavy and shot differently with each barrel, so the revolver proved the only satisfactory repeating weapon until the automatic principle was evolved.

The first weapon upon this system was the well-known Maxim machine gun which depended upon the action of *the recoil* to work the arm. This was followed by guns, such as the Colt machine gun, which worked on another principle of automaticity, that is to say, they did not use the recoil movement to function the gun but trapped a portion of the explosion gases and used these to work a piston and thus made a *gas-operated* gun.

There are then two distinct systems, recoil-operated weapons and gas-operated weapons. Machine guns and rifles have been largely made on both plans, but the recoil system is the only one as yet successfully applied to pistols, although one gas-operated pistol, the Clair, was made for a while in France.

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The Clair, was the only gas-operated automatic pistol I have heard of, and I believe was the only one ever marketed. This pistol was made by Clair Frères, of St. Etienne, and was remarkable in many respects. The magazine was a tubular one, similar to the Winchester rifle type, and lay in the handle which was curved. The cartridges were the standard French service revolver cartridge of 7·7 mm. calibre, and the magazine held seven shots.

When a shot was fired explosion gases were trapped two-thirds of the way up the barrel and escaped into a cylinder set beneath the barrel where there operated a piston which transmitting pressure along a rod, opened the breech slide against a recoil spring, ejected the case, cocked and reloaded the arm.

The weapon was large and clumsy compared with the French revolver, and it had also a folding trigger but no trigger guard.

Its ballistics were, however, an improvement upon the revolver used in the French service, itself an excellent weapon.

Clair. Initial velocity, 259 metres per second; penetration, 120 mm.

Revolver. Initial velocity, 229·3 metres per second; penetration, 85 mm.

For a long time development was delayed by the existence of master patents that prevented the utilization of various basic ideas and their adaptation to the modern cartridge, but upon the expiry of the master patents many small inventors and several great arms firms set to work to develop the automatic principle as applied to firearms and pistols in particular.

In the early days of experiment, smokeless powder for pistol cartridges, and, indeed, all concentrated smokeless powders were new, badly manufactured, and little understood. Black powder cartridges never

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worked well in automatic mechanisms owing to the vast amount of fouling, so one may say that the development of the automatic was dependent upon the advance of ideas in ammunition design and would not have been achieved but for the invention of condensed smokeless powder and nickel jacketted bullets.

The first man to attempt the automatic system appears to be an American, one Regulus Pilon, of 1863, who invented an automatic rifle of kinds. In 1866 Joseph Kurtis (Curtis ?) designed an automatic arm with a revolving cylinder magazine. In 1872 Plessner patented an automatic pistol, and in 1874 Lutze, an American, produced an automatic pistol with a forward moving barrel.

Savage, the well-known arms designer, was experimenting with Fassold in 1877, and in 1884 Krnka altered the Werndl rifle to an automatic mechanism. The early automatics were never more than rudimentary conceptions, and it was not until Schmidt-Rubin, of Geneva, invented the jacketted bullet and the device was generally applied to rifle ammunition, that the inventors began to turn their attention to the design of powerful repeating pistols or quick-loading pistol carbines, of which the Austrian " lightning pistol,"—the Werndl, was the single shot predecessor.

It is probable that the Schlëgelmilch magazine pistol was the weapon that is the mechanical forerunner of the automatic. In this weapon high-powered, nickel-bulletted, bottle-necked, smokeless-powder rifle cartridges were held in a magazine forward of the trigger guard. When the hammer was cocked a bolt was drawn back and then flew forward, carrying a cartridge. In fact, all the functions of the weapon was carried out by the motion of cocking, but the weapon was not recoil-operated or automatic.

Anyway, the Schlëgelmilch had a box magazine, a bolt action, and the general outline of the earlier

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automatics, and it appeared in 1891, before any of them.

Then came the semi-automatics, like Konrad Kromars pistol, and its successor, the earliest semi-automatic Mannlicher.

One finds patents and early experiments by many inventors, like Hiram Maxim, Andrea Schwarlose, Borchardt's " Prometheus " pistol, then comes the group of late nineteenth century pistols that were actually marketed: Borchardts, Bergmanns, Mausers, Brownings.

After Browning comes another group of inventions: Mars, Simplex, Schouboues, Fidjelands, Kraz, Charola-Anitua, and Clair, all of which came for a while upon the market but have not survived.

The most important of these I treat later in this chapter in the order of their appearance, but before passing on to them, there are two of the above that require a brief mention.

The Charola-Anitua was a pistol that was almost a model of the big Mauser, but was pocket size, it fired a special bottle-necked 5 mm. cartridge, and was the smallest bore lock-breech automatic pistol.

The first automatic pistol to appear in the English market was the *Borchardt* (1893). This pistol is the predecessor of the modern German official arm, the Luger-Parabellum, a weapon that retains the same base idea of a toggle joint breech action as the original *Borchardt.*

The Borchardt was clumsy, unwieldy, and so large that it was usually equipped with a combination holster stock for conversion into a carbine. The eight-shot magazine was set vertically in the handle, and the action was both frail and complicated. When a cartridge was fired the barrel and breech bolt locked together, recoiled until a pair of lugs on the frame lifted the toggle-joint action of the breech and allowed the bolt to continue its travel independent of the barrel.

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The bolt thus recoiled still farther, ejected the empty case and cocked the arm, then came forward again, feeding a new cartridge into the chamber, pushed the barrel forward and locked rigidly as the toggle joint fell into line.

The Borchardt was not a success, and its cartridges were badly designed, but, nevertheless, it was the ancestor of nearly all the distinguishing characteristics of modern automatics for it used rimless cartridges, smokeless powder, nickel-cased bullets, a clip magazine in the handle and various other constructional details that still continue.

Bergmann Pistol. A year later (1894) appeared the Bergmann pistol and several different models were quickly put upon the market in succeeding years.

The military Bergmann was of 7·65 mm. calibre, and had a box magazine forward of the trigger guard. It held ten cartridges staggered in the familiar manner of the Lee Enfield rifle magazine. It is usually known as the 1897 model.

The breech bolt slid in the frame, but besides moving directly back in parallel alignment with the axis of the barrel, it had an ingenious arrangement which connected it to the barrel (which was free to move backwards and forwards in an external casing) at the moment of firing. The head of the bolt was allowed a certain amount of lateral play, and when driven by the recoil spring toward the barrel the whole end of the bolt was out of alignment until it passed a hook block projecting from the barrel. As soon as this was passed the pressure of a side spring, and the shape of grooves in the frame, brought back the bolt into alignment and into engagement with the barrel hook so that it moved forward with the barrel to the locked or firing position.

Other models of minor calibre did away with the locked breech, and were of the ordinary blow-back type. Various improvements were incorporated, but

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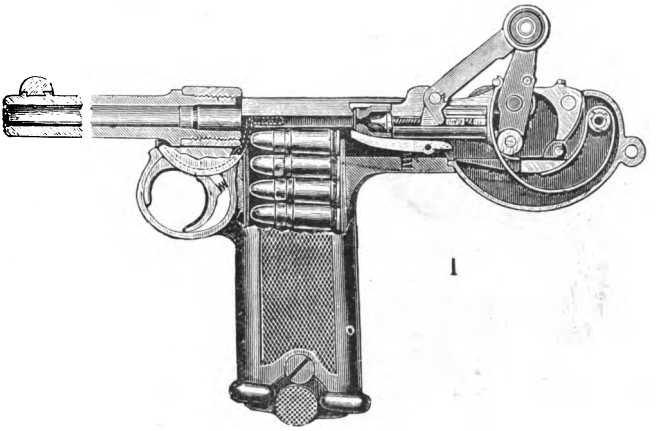
PLATE I

Early Automatics



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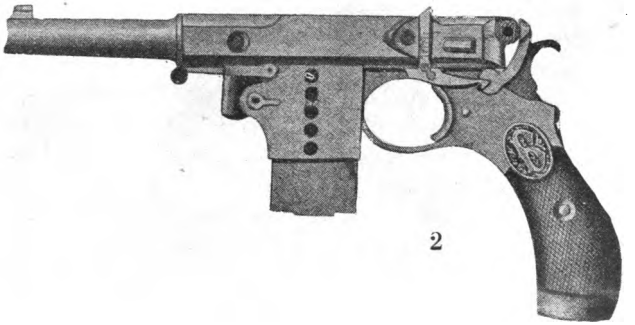

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1. Borchardt Pistol.

2. Bergmann Pistol.

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the general outline and design of the arm was not greatly varied.

The Bergmann's were made in 5, 6·35, 7·65, 7·8, and other calibres. Their ammunition was usually distinguished by a number, thus the 5 mm. is the No. 2, the 6·35, the No. 4, and so on. Of all these cartridges the 5 mm. is the only one still current and the others must be regarded as obsolete just as the Bergmann pistol is obsolete, though its successor, the Bayard, incorporates much of its design and is an excellent weapon.

The 5 mm. is one of the most typical of the original Bergmann models in this pistol.

Bergmann. The magazine was forward of the trigger guard and was of ingenious design. Cartridges were inserted either loose or in a clip dropped sideways into the open magazine recess when the flap cover was pulled down. This opening of the magazine compressed a powerful spiral spring situated under the barrel in a small cylinder. Connected to this spring was a curved lever which projected into the magazine recess. When the clip was inserted and the magazine flap cover closed, the compressed spring was automatically released and the lever entering the open base of the clip drove the cartridges up towards the feed aperture in the frame.

The clip was then withdrawn, empty, through slots provided for the purpose in the base of the flap cover, and the cartridges remained compressed in the magazine. The clips could be kept and reloaded or thrown away, or the weapon could be loaded with loose cartridges without the use of a clip.

The weapon was loaded by pulling back the breech bolt, which was a long light slotted cylinder, working in the frame. The recoil spring was a rather long weak spiral held inside the breech bolt, and around the striker, which was a very long thin and slender steel firing pin. This was made very light, and had no spring or arrangements for preventing the shock of

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the closing action firing the charge, but owing to its light weight and free play this fault never occurred.

Behind the end of the bolt was an outside hammer which was forced back into the cocked position as the bolt was drawn back. A side lever worked an intercepting safety, and the lockwork was protected by an easily removable inspection plate.

To remove the barrel for cleaning, one screw was taken out, the barrel then could be turned from right to left on its seating and withdrawn from the frame.

To remove the bolt the transverse screw holding the head of the firing pin was removed, the pin withdrawn, and then the cross bolt of steel passing through the frame and through the slotted bolt could be withdrawn releasing the coil spring.

The pocket model Bergmann was of 5 mm. calibre, and fired a special conical cartridge which had neither rim nor the ordinary rimless groove because the pistol had no extractor, and did not need one, the recoil serving to eject the empty case. It is notable that this cartridge is the smallest practical central fire cartridge made, and the bullet is smaller in diameter than the ·22, being 5 mm., that is ·196 in. It is nickel covered and penetrates about 2½ in. of wood (private test with some very old cartridges. New stuff may be better).

The pistol is very small and flat in the pocket, about 7 in. long, over all weight 17½ oz., and owing to its pistol shape the butt is ready to hand and the balance in the pocket good. The trigger of the pocket model is made to fold forward of the magazine and under the barrel. In the larger types it is in the ordinary pistol position behind the magazine, but in the 5 mm. model this is impossible owing to the small size.

The larger Bergmann's vary very much, and some are provided with hair triggers and target sights. Even the little pocket model has a bead foresight, and is extraordinarily accurate and easy to shoot with.

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The Bergmann suffered from faulty feeding in the magazine in its larger calibres, and another source of trouble was frequent breakage of the firing pin. If kept perfectly clean and well lubricated they work very well, but they are not as reliable or as fool-proof as more modern weapons.

The 5 mm. is rather delightful, as it has so many good points in such small compass, for it makes less noise than the ordinary ·22 cartridge and is splendid to use in a room, but on the whole all other models of Bergmann (unless Bayards have recently got out new ones for ordinary Browning cartridges) must be regarded as obsolete.

The next weapon to appear was the Mauser (1898) combination automatic pistol, or carbine, the wooden holster serving as a stock attachment. This was the first really satisfactory automatic pistol to be marketed, and is in use to the present day. In this piece the barrel and breech block recoiled together for a short distance, after which the automatic check released the bolt and allowed it to continue its travel, ejecting, cocking, and reloading the chamber. The magazine was of the box type set forward of the trigger guard, and held eight cartridges, loaded into it from above by means of a clip which was held in a notch in the frame. On withdrawing the empty clip the bolt closed, automatically reloading the chamber. The lock work was remarkable for the whole weapon could be dismounted without the use of tools other than the point of a cartridge, and did not contain a single screw, all pieces being milled and interchangeable.

The powerful 7·65 mm. bottled-necked cartridge and nickel-covered bullet were capable of good work up to 600 yards, and the weapon was sent out with a military standard sight graduated to 1,000 metres. This was for use as a carbine, the wooden holster case serving as a stock. Viewed as a pistol simply, the weight, bad

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balance and powerful recoil did not make it a valuable weapon as a pistol, and without its holster stock it threw amazingly high, but as a high-speed, long-range weapon for self defence it was an advance on all its predecessors, and a number were used by the Boers during the Boer War.

It is interesting to note that it was with these weapons that two Russian anarchists were able to defy the police of London and initiate the memorable "siege of Sydney Street," an affair which necessitated the calling out of the troops and raised such a popular outcry over the inefficient armament of the London police that they, too, were shortly armed with an automatic pistol of approved type.

Close upon the heels of the Mauser came, in 1898, their rivals, the Mannlicher firm, with the Mannlicher automatic, using a clip-loader very similar to the Mauser clip, but with the loading into a magazine inside the handle, a type first started by the Borchardt and popular ever since.

Mannlicher. The first Mannlicher was the 1894 model, which was not a success. This pistol was somewhat similar in appearance to the 1898 and 1901 models but on a different principle. In it the barrel moved forward and the breech and slide were fixed. The pistol was really a semi-automatic, for it had to be cocked for each shot though a model with a double-action trigger pull similar to a revolver was also made.

In the 1901 model, the breech block recoils, pulling a slide underneath the barrel where the recoil spring is held. The lock-work lies along the side of the magazine, under the grips, and the whole weapon can be taken apart by hand and without tools. The 1901 model is used in the Austrian service.

The lock mechanism was not as beautifully designed as the Mauser, but its system of operation was substantially the same. Specimens of this arm are still to be found in Spain and Latin America. It holds

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a clip of six shots. Initial velocity, 300 metres per sec.; range, 800 metres.

Special cartridges are required for it, a long 7·65 mm. cartridge, and it is little known in Great Britain though popular on the Continent.

For a while there was a halt in production while the great arms firms experimented with systems and patents, they made many experimental weapons of lesser importance, few of which reached the outside world, the "Mars," or Gabbett Fairfax, a weapon made by a British firm, is an instance of this type.

By 1898 the name of the Browning automatic system began to be heard, and soon the Browning automatic pistol of ·32 calibre made its appearance, and owing to its excellence sprung into universal popularity as the latest thing in pocket pistols. The ·32 or 7·65 mm. Browning cartridge is now standard all over the world, and was further popularized by the adoption of the Browning patents by the Colt Firearms Co., whose excellent plant and material produced in 1903 the ·32 Colt Hammerless automatic, a weapon much superior to the Continental-made Browning.

The adoption of the automatic pistol by a firm of the eminence of the Colt Company practically established the principle. People no longer looked upon automatics as dangerous experimental toys, but recognized that the principle was a success, had come to stay, and would eventually oust the revolver.

The automatic is, practically speaking, a twentieth century development of firearms. The earlier weapons were not effective, and it is only during the second decade of the century that automatic pistols have come into general use. By 1900 the principle was just out of the experimental stage, and by 1950 the revolver should be extinct, but for the moment, and despite the impetus given to the inventions by the great world war, the revolver is still the better weapon.

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This closes the historical chapter, and from now on I shall deal with the varieties of automatic pistol under a rough classification of service, intermediate and pocket weapons. Some of the makes that will be included may never be made again, for many of them came from Belgium, and it is still impossible to say how much private property the Germans have stolen or destroyed, or what fate has befallen their museums of arms and the records of their arms industry. Others may have been superseded by newer models, but in the main all these may be classed as modern up-to-date weapons.

The post-war phase of firearm invention should bring to us the fulfilment of promise that the automatic principle carries. In the past the years after great wars have been most notable in the development of inventions connected with firearms. Already the Birmingham Small Arms Company and the Remington U.M.C. are experimenting with pistols which will embody the latest scientific knowledge and the best modern practice. These will be the pistols of the future, embodying the whole knowledge of the past.

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CHAPTER III

MILITARY AUTOMATICS

THE "Service" or military model of a pistol can usually be taken as the most serviceable and durable type of that particular make. This does not mean that it is of necessity the neatest, the most accurate, or even the best design, but it is the type the makers consider most suitable for hard usage and the exigencies of military service.

In Great Britain and the United States ·45 is the standard military calibre, for smaller bores have not sufficient stopping power although their ascertained velocities may be higher than those of the ·45 cartridges.

The U.S.A. were the first Government to take up the automatic as a military weapon, and tests were held and a limited number of Colts ·38 auto-military model and Luger-Parabellums ·30 calibre adopted into the United States service in 1903.

Both these are now superseded and the Colt ·45 auto, Government model, is the standard U.S.A. military pistol, and has also been adopted by the Canadian Government as an official issue.

The British Army retains the ·455 Webley revolver as a weapon, but the Navy has had the ·455 Auto-Loading Webley pistol issued as its official arm. This weapon may prove satisfactory for sea use, but experience with it on land by officers during the war credits it with being easily clogged by sand or dust, and equally so with mud in trench warfare conditions.

NOTE.—The authorities have just invited the big arms firms to submit automatic pistols of new design for the purpose of selecting a new weapon for Service use. *July*, 1919.

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As an accurate hard shooting weapon it has done well, but up to date the models issued are not of a design suitable for quick instinctive shooting, as the handle is set almost square to the frame and the pistol sights do not align themselves instinctively as they do with a sloping handled or "pistol-handled" weapon.

Our forefathers made and used weapons for many years, and the handle set square to the barrel has never been found useful. The nearest approach to it in history was the "saw-handled" duelling pistol, but this, at its worst, was preferable to, and more "natural" to handle than the square-handled types of modern automatics. The taste for saw handles died out swiftly, for in duelling days it did not pay to indulge unsuitable fancies.

With the large bore automatics pretty well all the makers made this mistake about the square-set handle. As they realized it, handles have become progressively more sloping and more natural to the hand. There is a more serious side to badly designed grips in an automatic than appears at first sight. Any pistol can be properly aligned on a target when there is time to spare, but in a tight corner few people ever see their sights, but shoot instinctively. If you do this with an automatic, whose handle is all but square to the barrel axis, you will find that the shots go so low that most of them would be in the ground in twelve yards. A good way to assure oneself of this is to fire (on an empty chamber) instinctively at some object with the eyes closed, or simply look at the object and then "snap." The correction of aim that you will have to make will astonish you, and you will find that the more closely the grip of your automatic adheres to conventional pistol lines the better you will shoot.

The ideal lines for any pistol are those of the old muzzle-loader duelling pistol. A weapon should fit the slant of the gripping hand, it should be as low in the hand as possible, and it should balance well forward.

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A comparison of the first ·45 Colt Auto, and the later Government model, will show how manufacturers have realized the need for change, and it will be noted that their latest automatic pistol, the ·22 Colt Target, shows the same progressive spirit.

The Webley and Scott ·455 High Velocity Automatic Pistol carries seven shots in the magazine, weighs 39½ oz. complete, is 8½ in. over all length, and 5½ in. deep. The charge is seven grains of pistol cordite, the bullet weighs 220 grains, and it fires a *special rimless cartridge, not the standard service* ·455 *revolver ammunition.* The weapon has an automatic safety grip, and remains open when the last shot has been fired. The back sight is laterally movable and can be used as a wind gauge, the foresight is a massive knife edge on the barrel itself, and not on the casing or breech slide, as is common with most automatic pistols. The pistol is of excellent workmanship throughout and the breech action is sound, while its shooting is exceedingly accurate, but it is not a weapon of outstanding merit.

The Webley Fosberry automatic revolver was introduced in 1900 and is now no longer made, but it is worthy of notice as being the connecting link between revolvers and automatic pistols. As a service arm it was not altogether successful, and was never officially adopted, but was excellent for less robust usage.

In the Webley Fosberry the recoil drove back barrel and cylinder in a frame, along a slide where an intercepting stud rotated the cylinder by engaging with grooves in its periphery (the same principle of cylinder rotation is found in several old revolvers, notably the early Mauser). At the end of its travel it left the hammer cocked and was returned by a recoil spring to its forward or firing position.

The weapon functioned well when clean, but very little mud or dust was enough to put it out of action, and the height of cylinder and barrel above the

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hand was excessive. Another of its faults was that to obtain the full effect of the recoil the arm had to be held rigidly and quick shots tended to balk the mechanism owing to their allowing their arm muscles to absorb the recoil in the method usual and instinctive among pistol shots, with the result that there was not enough force left to work the action.

The Webley Fosberry was made to take the ·455 cordite service revolver cartridge, but would also work with black powder ammunition of ·455 and ·450 size. Later a ·38 model was issued to take the ·38 automatic cartridge. This held eight cartridges loaded into the cylinder in a clip, and weighed 2 lb. 6 oz. Total length, 10 in.

The ·455 Webley Fosberry was made in several barrel lengths—

4 in.—weight,	2 lb. 8 oz.;	length,	8½ in.
6 in.	,, 2 lb. 8 oz.;	,,	10½ in.
7½ in.	,, 2 lb. 8 oz.;	,,	12 in.

and fired six shots. In general appearance the weapon was similar to the Standard Webley Service revolver.

The *Webley and Scott High Velocity Military Model* ·38 automatic pistol uses the standard ·38 automatic cartridge (a size not to be confused with the ·380 automatic or 9 mm.) has an eight-shot magazine, weighs 25½ oz., measures 8 in. over all by 5½ in. deep. Powder charge, 6 grains; bullet, 130 grains. Initial velocity, 1,060 ft. secs. Initial striking energy, 350 ft. pounds. Velocity at 50 yards, 1,000 ft. secs. Striking energy at 50 yards, 280 ft. pounds.

The weapon is hammerless and built on smaller lines than the Navy model, but is otherwise very similar. The cartridge gives very high velocities and is extremely powerful, but the calibre of ·38 is not one that is accepted as a military bore in the United Kingdom though adopted as such by some Powers who have less experience

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of savage warfare where hard hitting, shooting, or stopping power is what is required.

The Colt's Patent Firearms Manufacturing Co. make a wide range of automatic pistols, and were the first to bring out a ·45 calibre automatic. The original model had a seven-shot magazine, 5 in. barrel, weighed 33½ oz., length over all, 8 in., and used a rimless cartridge with 200 grains bullet.

This was soon superseded in 1911 by the Government model calibre ·45, which has a much better slanting stock, a safety grip, a better external hammer and many minor improvements. The present model has a seven-shot magazine, 5 in. barrel, 8½ in. over all length, weight 39 oz., fires ·45 U.S. Government cartridge with 230 gr. bullet. This pistol was adopted as the official pistol of the Canadian troops in Flanders and proved exceedingly serviceable. As a target weapon it is very capable, though it should be fitted with special sights for target work. As a reliable all-round service size automatic pistol, it is in my opinion the best military automatic yet made.

The U.S. were the first Government to take up the automatic model, and Luger-Parabellums ·30 calibre were adopted into the U.S. Service in 1903. The previous Colt ·38 and the Parabellum 7·65 mm. used in the U.S.A. Army experimentally, are now superseded, and the Colt ·45 auto, Government model, is the standard U.S.A. military pistol, and has also been adopted by the Canadian Government as an official issue.

A model was made during the war with the barrel bored and the magazine expanded to take the Webley ·455 auto-loading cartridge; it is reported satisfactory, but not equal to the more popular Colt ·45 auto cartridge.

The *Colt Military Model* ·38 is used in some countries as an official weapon, and is built on much the same pattern as the early ·45 automatic Colt, but has a longer barrel, and is the better balanced weapon of the two.

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It had an eight-shot magazine, 6 in. barrel, and was 9 in. over all. A smaller model of this known as the Pocket Model ·38, was also made. (See Chapter on Intermediate Weapons.)

The *Luger-Parabellum* is the German Service pistol, and is issued in 9 mm. bore, firing a cartridge whose value is between the ·38 auto and the ·380 auto. Muzzle velocity, 1,150 ft. per sec. The charge is nitro-cellulose powder and the bullet weighs 125 grains, either nickel or copper-coated with a sharp coned nose cut off square. Weight of pistol, 1 lb. 15 oz.

This weapon is the lineal descendant of the original Borchardt, but has been very much improved. The barrel and breech block recoil together till lugs upon the frame force up the toggle joint and allow bolt and barrel to separate. The scear is unusually placed being at the side of the action and somewhat free to clog, but taken as a whole the pistol is well made and well designed. It has an excellent grip, an easy safety catch, and is easily dismounted for cleaning though difficult to reassemble. The trigger-pull is rather long and creeping, but it shoots extremely well, lies low in the hand, and has an excellent service foresight that is easily caught by the eye. All except the tip of this sight is transversely milled so as to appear of darker colour to the polished point.

The weapon is fitted for an attachable holster stock when issued to the German navy, but these were not largely used for land service, nor were the long barrelled models with long range back sights normally issued to the troops. The ordinary holster has a spare magazine and dismounting tools supplied with it.

To dismount, the magazine is removed, the barrel pressed slightly back, the stud on right-hand side, over trigger guard, then pressed foward, till at right angles to barrel. The barrel will then move forward and the lock cover, the square plate over the trigger is then

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PLATE II

Modern Military Pistols

1. Webley ·455 Auto. 2. Colt ·45 Government Model.
3. Parabellum 9 mm. German Army Model.
4. Mannlicher 7·65 mm. Military Model. 5. Colt ·38 Automatic.

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removable, and the barrel and breech bolt can come forward off the frame, the toggle hook lever disconnecting from the recoil spring *if the weapon is held upside down.*

The remainder of the mechanism can be inspected by stripping the left-hand wooden grip (held by a screw at the bottom over magazine recess). The recoil spring is a spiral wire spring worked by the bell crank lever which engages with the toggle hook. To reassemble, reverse processes and *hold upside down* till hook drops into place.

The parts are interchangeable and very well made, and the extractor on top of the bolt serves as an indicator to tell whether the chamber is loaded or not. The first portion of the bolt-travel serves to cock the striker, so the weapon may be carried loaded yet not cocked, and cocked by a short pull up of the toggle grips, which is enough to cock the arm without clearing the chamber.

As a piece of design it is curiously efficient, but its small calibre, high velocity, and rather delicate lock work are points against it as a purely military arm. It is really very German in its psychology—it is wonderfully designed—theoretically capable of great things, but when taken practically it tends to break down through over organization, and its very virtues become defects.

The *Mauser Military Model* is also 9 mm. calibre, an enlargement upon its original 7 mm.—·300 bore. The official models for use as pistols are without long range rear sights, but otherwise substantially the same as the original Mauser pistol carbine. The whole weapon is dismountable without tools but is infinitely easier to reassemble than the Parabellum. It is provided with a ten-shot magazine, clip loader, weighs 2½ lb., and has a 5½ in. barrel. Muzzle velocity, 1,070 ft. sec.

The *Browning* 9 mm. (long) military model was the standard Belgian and Swedish Army pistol, it is

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seven-shot, weighs 33 oz., and is very similar in appearance to the Colt ·380 pocket model, though rather longer and having a 5 in. barrel and an overall measure of 8 in. It is adaptable to a holster stock, hammerless, reliable, and hard-hitting. The load is 5 grs., and the bullet, 110·3 grs.; muzzle velocity, 950 ft. per sec. Energy, 247 ft. lbs. It is usually sold as the F.N., the initials of the " Fabrique National d'Armes de Guerre," at Herstac, Belgium.

The *Mannlicher* 1901 *model* is a ten-shot pistol firing the 7·63 mm. Mauser cartridge (·300), 85 grain bullet, muzzle velocity about 1,394 ft. per sec. The magazine is in the grip which is unusually long, and the pistol is easily taken apart. It has an external hammer, and the recoil spring is held in a recess in a slide beneath the fixed barrel, while the lock is contained beneath the side plates of the grip. It is well made but awkward and over-powerful for its small bore. Standard issue for Austrian officers.

The latest product of the Steyr factory, the celebrated armoury of the Mannlicher firm, is the 1916 *Steyr Mannlicher* pistol.

This weapon is used in the German army as well as the Parabellum, and a captured specimen in my possession is marked with the Austrian proof mark, W.n., double eagle, and the date " 16," while the name Steyr, 1916, appears upon the side. The letter K appears stamped upon all parts, and the number 17 upon the slide and also upon the frame. The holster carefully designed to fit the pistol and provided with two receptacles exactly accommodating two spare ammunition clips, is stamped " A.W.M. Sattlesgenossenchaft Munchen." The supposition is that these arms are issued to Bavarian units whose equipment varies in detail from other branches of the German service.

At first sight the weapon seems to be a hybrid between the Mannlicher and the ·38 automatic Colt,

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PLATE III

Latest German and Austrian War Models

·32 calibre Pocket Model Mauser Pistol.
(War Trophy, 1917.)

Steyr-Mannlicher 9mm. military automatic
Clip loader. (War Trophy 1916.)

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but a closer investigation reveals a rotary barrel-locking device is also incorporated.

The calibre is 9 mm., and a special long cartridge with a pointed bullet is employed. The magazine is in the handle, and the weapon is a clip loader, each clip holding eight rounds.

The spiral recoil spring is held in a recess beneath the barrel. When the bullet is passing through the barrel it tends to rotate the barrel in a clockwise direction. In this position wormed feathers on the top of the barrel engage with slots in the barrel slide, which is part and parcel of the breech block.

When the bullet leaves the muzzle, the forces of recoil acting upon the slide are no longer counteracted by the barrel's screwing up tendency and the barrel is unlocked, that is to say, unscrewed from the slide by moving back with it, for half an inch, after which the screw threads on top of the barrel come out of engagement with the slide grooves and the rearward motion of the barrel being arrested by a stop, the slide continues back cocking the hammer and ejecting the empty case.

The energy stored recoil spring then comes into play and closes the action, the return of the breech block forcing a fresh cartridge from the magazine into the chamber, and the pressure of the breech against the end of the barrel pushing it forward so that it rotates in its slide and the locking screw again locks in engagement with the breech slide.

The weapon is well made, well balanced, and simple, though the angle of the magazine grip and the barrel is too acute to make the weapon a good service pistol.

To dismount the weapon the flat bolt that passes through the muzzle end of the slide is pushed out from left to right. The slide is pushed back as far as it will go, and lifted breech end first. The pistol will then come apart and the barrel drops out into the hand.

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All parts are easily dismounted without tools. The bar connecting scear and trigger can be taken out of its groove and the ejector blade can be lifted out of its socket. In replacing the trigger bar, the ejector blade block must be forced down against its spring to allow the former to seat properly in its groove. Removal of the recoil spring is effected by pressing down the catch of the spring thimble, which is exposed in the slot of the frame underneath, and half an inch from the muzzle end of the barrel support.

In reassembling the pistol after the barrel has been dropped into place and the slide (fully drawn back) dropped down over it so that the forward end is engaged, the hammer should be pulled back just over full lock, when the rear end of the slide will also engage and the slide can be pushed forward if the magazine depressor catch is held down.

Sighting adjustment is effected by means of a laterally adjustable foresight. This is usually supplied, sighted for 5 metres range, but others for longer ranges can be fitted. The sighting is not peculiarly good though the weapon is very consistent in its shooting.

Taking the Steyr in comparison with the Parabellum, it is less complicated than the latter, but not so well designed or easy to shoot with. The pointed bullet possesses great penetrative but little actual stopping power, and is probably less effective than the Parabellum and much less so than the service revolver.

Overall length, 8½ in.; weight, 18½ oz.; calibre, ·355 in. bullet, 116 grains, 6 grains cellulose powder; muzzle velocity, 1,150 ft. sec.; velocity at 60 ft., 1,118 ft. sec.

NOTE.—This charge will penetrate two standard British shrapnel helmets back and front.

The *Glisenti* is the official automatic pistol of the Italian forces, and is practically the military Browning, but with a longer barrel. The weapon was made at the Brescia arsenal as the F.N. factory was in enemy hands.

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The pistol is issued in two sizes, 9 mm. service and 6·5 mm. officers' model.

Another Italian pistol is the *Beretta* 1915 model, made by Pietro Beretta, of Brescia, in their arms factory, founded in 1680. This arm is unusual in that it fires the 9 mm. Parabellum cartridge with a plain blow-back action, but I fancy that the Italian powder gives rather weaker results than the standard German load.

The pistol is small and compact, measures 6½ in. over all, weighs 2 lb. 2 oz.; holds seven shots, and the recoiling parts weigh ¾ lb.

The barrel is held by a single vertical pin lump engaging with the frame, but is further secured by the locking of a ring on the muzzle into a recess in the side when this is in the forward position. The recoil spring is beneath the barrel similarly to the Colt, but is supplemented by a powerful flat ribbon steel coiled buffer spring to take the shock of the recoil slide against the frame.

The pistol appears well made and finished, and has two safeties. Dismounting is accomplished by locking the slide at its rearmost point and lifting out the barrel vertically. The weapon has earned a good reputation during the war, and is apparently successful in its functioning. Particulars of its ballistic efficiency are not to hand, but it is probably little inferior to the Parabellum in performance and much less complicated to make.

In shape the usual square grip with magazine in handle is followed. The action stays open after firing, and is in this faulty in design, as it is difficult to disengage the magazine against the pressure of the slide.

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CHAPTER IV

INTERMEDIATE SIZES

AUTOMATIC pistols fall fairly easily into the two big divisions of military models and pocket models, but there are a number of intermediate sizes which are too big for the civilized pocket and too small for savage warfare. They may be termed good police pistols, for they are weapons that can be carried in a belt holster or at a pinch concealed about the person, and some of them are even used as military weapons in various small armies. My classification is an arbitrary one, but I have adopted it for the reason that it enables one to make a clearer distinction between the two main classes.

The first example is the Colt ·38 pocket model. This is a weapon that is simply a shortened version of the Colt ·38 military, and is the most powerful of the intermediate weapons. It has an outside hammer, seven-shot magazine, and is 7½ in. over all. Weight, 32 oz. It is remarkable in that it is fitted with neither grip nor side safety devices, the half cocking of the hammer being all that is necessary.

This renders the pistol an unsuitable one for the novice, but it is an excellent *fighting weapon*, free from complications and handy to use.

The *Webley* 9 mm. has an outside hammer, and eight-shot magazine, and is 8½ in. long over all, weight 36 oz.

The 9 mm. cartridge is a standard European automatic size, and is made in two lengths, the *short* and the *long*. Its real calibre is ·35 of an inch, but it is classed as ·380 automatic. This is slightly confusing, but the best way of understanding it is to grasp that the Continental 9 mm. short is the ordinary ·380 automatic

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size, thus the 9 mm. cartridge, when speaking of Continental or American pistols, means the 9 mm. short 92 grain bullet, 22 grains powder, practically identical with ·380 auto 95 grain bullet.

The size known as 9 mm. long or military, is the cartridge adapted to the military model Browning and Bayard, and the 9 mm. military Webley. It has 110-grain bullet and 5 grains of powder.

The Webley 9 mm. has a big grip safety, and is well balanced and comfortable in the hand. The slide remains open when the magazine is empty. The pistol might be a very suitable one to take in a country where the regulation military pistol chambered the 9 mm. military Browning cartridge, and is designed as a military arm. I have placed it among the intermediate sizes because of its rather smaller capacity in power and calibre than the Webley ·455 auto and ·38 auto high velocity models.

The *Luger* ·30 or 765 mm. is a smaller bore version of the Parabellum, but not very much smaller in size than the service model. It has a grip safety similar to the familiar Colt model, a fitting which is not applied to the military model. The cartridge is a very powerful bottle-necked pattern, giving a muzzle velocity of 1,134 ft. and extremely long range. This weapon has some popularity in South America, but its small bore and excessive penetration makes it of less value as a stopping weapon than many of the pocket pistols half its size. It is the official Swiss military pistol.

There are one or two makes of Spanish automatic that are termed police or military models, and are larger than pocket size. These weapons have been made in quantity during the war and exported all over the world. There is not a good word to be said for any of them, for they are badly made, badly designed, badly finished, and of the most inferior

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material and workmanship. Also they are mostly chambered to take the ·32 auto pocket pistol cartridge.

Though these weapons may have been proved in the usual way, it is unsafe to rely upon them, for the material is so extremely bad that split barrels in proved pistols have been frequent.

There may be a few qualities of pistol in Spain that can be depended on, but judging by their exported samples the only safe means to adopt is *to refuse to have a Spanish pistol of any kind at any price.*

The Spanish pistols are often external replicas of well-known makes, misleading names are stamped on the barrel, and they are frankly cheap and nasty copies of good stuff. Such methods dishonour the arms makers of Spain, and are a reflection upon the national business honour. The only way to deal with such stuff is to bar it absolutely and buy the pistols made by reputable firms of any nation other than the Spaniards. I have mentioned this matter here as the larger models are the more dangerous, for they are sometimes sold as military pistols. They are all bad and dear at any price, for be it remembered, there is no economy in buying a cheap Spanish pistol for a pound less than a good English or American pistol, and then blowing your fingers off with it. The prices asked for these weapons in England during the war have been exorbitant, in many cases they have been priced as highly as first-class British or American makes, though their wholesale price is actually about a third of the latter.

The Spanish Army has adopted the 9 mm. Bayard military model as a regulation arm, but is, I believe about to change. This weapon has the magazine forward of the trigger similarly to the larger Mauser. It balances well, is flat and compact, and can be fitted with a holster stock. This weapon is made by

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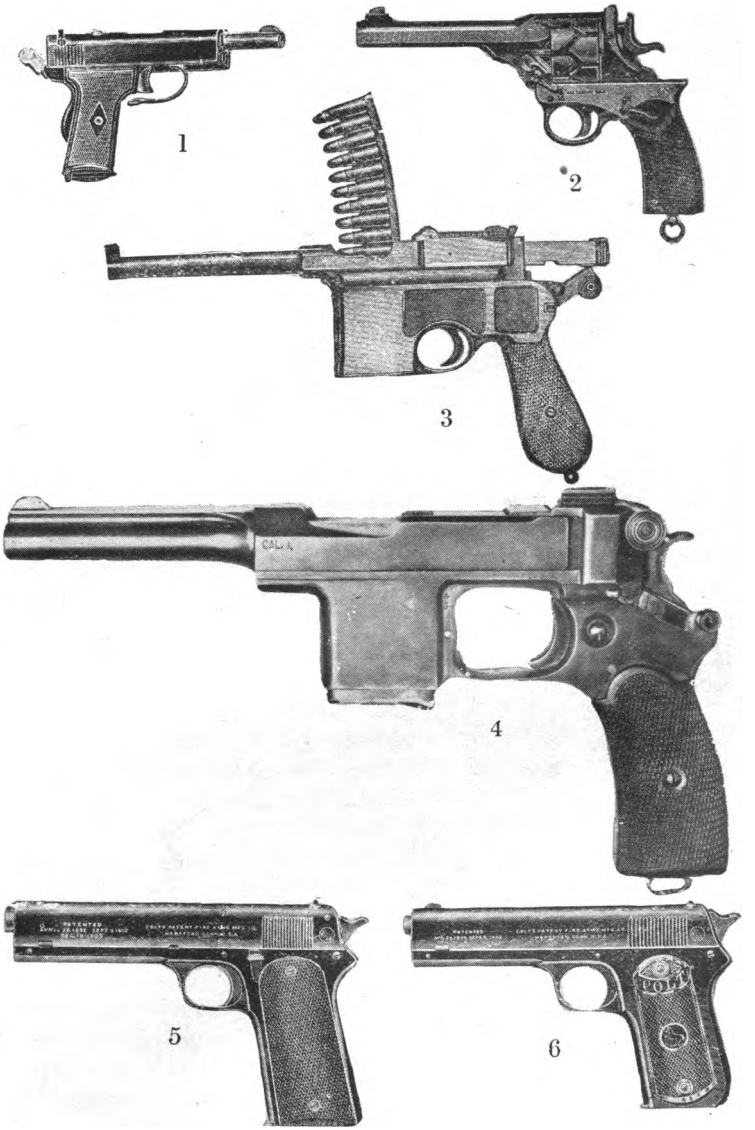
PLATE IV

Heavy Models



1. Webley 9 mm. High Velocity.
2. Webley-Fosberry ·455 Automatic Revolver. 3. Mauser Pistol ·300.
4. Bayard 9 mm.
5. Early Model Colt ·45 Auto. 6. Colt ·38 Short Hammer Model.

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Piepers, at Herstal, near Liége, in Belgium, and is quite a satisfactory piece of workmanship and design.

The fact that the Spanish official pistol is not Spanish made shows the value set upon Spanish pistols by the authorities of their own country. All Spanish pistols were withdrawn from the British Service as unreliable and dangerous in 1917.

The F.L. Selstlader. A number of these pistols appear to have been issued to German troops as an official weapon, but in essence they are pocket or police pistols rather than a military arm.

The F.L. is a ·32 calibre automatic eight-shot pistol, very similar to the old model Browning in appearance and general design. The main difference is the easy take-down method employed, by which the breech block and the recoil slide can be taken apart and removed from the frame.

The breech block moves in grooves in the frame, and the recoil slide, containing the recoil spring, is of the familiar Browning type with the spring above the barrel. The slide and breech block are connected by a hinged block carrying the rear sight.

To dismount the arm a rear screw, which is provided with a milled head, is unscrewed. This allows the hinged sight block to be lifted up clear of its engagement with the breech bolt and the recoil slide and hinged bolt can be drawn off over the muzzle end of the barrel while the breech block is free to be drawn off in the opposite direction. The weapon is simple, well made, and nicely finished, while the sighting is clear and easily picked up. Its manifest disadvantage is the risk of the take-down screw working loose while the pistol is in use. In such a case it would fire its breech block into the user's face with considerable velocity.

The extractor and safety are both rather frail, but

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the arm is of convenient size and good for accurate shooting. Some 23,000 of these weapons appear to have been made if the frame number is correct. The specimens examined bore traces of hurried machining, such as would be noticeable in arms made under war conditions. Pistol weighs 1 lb. 4 oz.; overall length, 6½ in.; eight shots ·32 calibre.

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CHAPTER V

POCKET AUTOMATICS

POCKET automatics are made in three calibres, ·380 automatic or 9 mm. short, ·32 or 7·65 mm., and ·25 or 6·35 mm. The ·380 and ·32 cartridges are comparatively more powerful than the ·380 and ·32 pocket revolver cartridges, and the ·25 is for its size, extraordinarily efficient, although it only possesses two-thirds of the efficiency of the familiar ·22 long. With the exception of the ·380 none of the above have much actual stopping power as the metal-cased bullet tends to penetrate right through the body rather than develop its whole energy and remain flattened in the tissues; but for ordinary self-defence work other than war the ·380 auto and ·32 auto are amply powerful.

The ·25 is the cartridge for the little vest pocket models, and is excellent for that purpose; but though the ·25 will kill, it is rather too light and small to be relied upon, and the whole range of ·25 pistols must be regarded as emergency weapons—not toys by any means, but only for use at very close quarters and in extreme cases.

Colt Pocket Models, ·32 and ·380 auto, is a hammerless pocket pistol of convenient size and weight. The ·32 holds eight shots in the magazine, the ·38 seven. There is little difference between the two calibres, the pistol being practically the same in outside dimensions and general action.

The earlier models of this pistol can be distinguished from the present model by certain external differences in the shape of the slide, and the fact that the end of the barrel is not chamfered or enlarged at the muzzle end but projects from the casing as a perfectly straight

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tube. In the earlier models the device for retaining the barrel was similar to the bushing device used on the ·45 Government model for this purpose.

In the present model the barrel is not bushed in the slide, and is easily removed by rotating to the left so as to disengage the locking threads on the barrel from their engagement upon the frame. The earlier models are less satisfactory than the present type and tend to wear more speedily.

The arm is well equipped with safeties. There is one in the action which prevents the fall of the hammer unless the breech is closed. The side safety indicates when the arm is cocked, and can be applied at will. and the grip safety prevents the weapon being fired unless it is firmly gripped in the hand.

This grip safety, too, serves as an indicator of whether the weapon is cocked, and is only operative in the latter case. The sighting of the weapon is fairly good.

The barrel is 3¾ in.; over all length, 6¾ in.; and the weight, 23 oz.

The Colt ·25 is the smallest model Colt made, it is a six-shot weapon, 2 in. barrel, 4½ in. over all size; weight, 13 oz., and has the safeties of the 3·2 model embodied. This little weapon is very accurate and very reliable, and later models with numbers above 141,000 are fitted with a safety disconnector so that *even if there is a cartridge left in the chamber, once the magazine is withdrawn the weapon cannot be fired.*

It is probably safer than any other automatic pistol, and is quite powerful enough for the purpose for which it was designed.

The *Webley and Scott M.P.* pocket auto of ·32 auto calibre is the official arm of the Metropolitan Police of London. It differs slightly from the standard pocket model by having a raised fixed back sight, taking more shots in the magazine and remaining open after firing until a new magazine is slipped in.

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PLATE V

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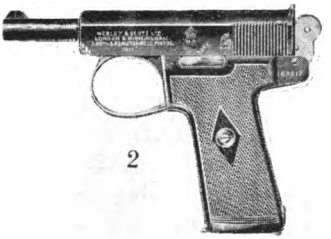
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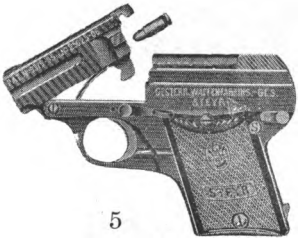
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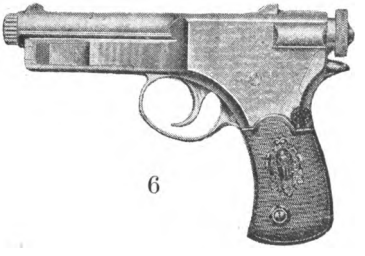
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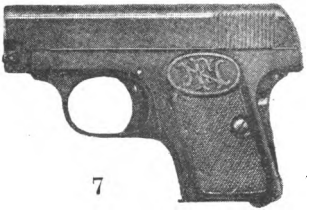
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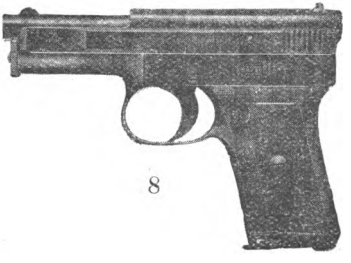
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1. Savage ·32. 2. Webley M.P. ·32. 3. Walther ·32.
4. Colt ·32 5. Sterr-Pieper ·25.
6. Roth-Sauer ·32 Special. 7. F.N. Browning ·25. (Baby Browning).
8. Mauser ·32 Pocket Model.

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The ·32 auto and ·380 auto models are easy to manipulate, quick firing, and accurate.

To dismount the pistol for the purpose of cleaning it is only necessary to pull forward the trigger guard, this is done without the aid of any tools. The weapon can thus be taken apart by hand, and the barrel and slide removed.

An efficient safety is provided permitting the pistol to be carried at full cock without danger of accident. The safety is always in engagement; so before firing, it is necessary to raise the lever on side of pistol until it covers the word " safe."

·32 or 7·65 calibre.

Weight of the pistol, without magazine	18 oz.
Weight of magazine	2 oz.
Length over all	6¼ in.
Depth	4½ in.
Capacity of magazine	8 shots
Weight of powder	3½ grains
Weight of bullet	75 grains
Initial velocity	1,050 ft. secs.

Penetration at 20 yds.—seven 1 in. pine boards placed 1 in. apart.

The ·380 holds seven shots and has the same external dimensions.

Webley Pocket Models. The Webley ·25 vest pocket models are made in two models, hammer and hammerless. The former being a miniature replica of the larger ·32 and the latter having a striker firing-pin similar to the Colt ·25.

The Webley ·25 Hammerless is the lightest pocket auto made by any reliable firm, it weighs 9½ oz., holds six shots in the magazine, is 4¼ in. over all length, and 3⅛ in. deep.

The Hammer model is earlier and rather bulkier.

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It weighs 11 oz., holds six shots and measures 4¾ in. over all by 3⅛ in. deep.

Hammer Model, ·25 or 6·35 calibre.

Weight of the pistol, without magazine	11 oz.
Weight of magazine	12 drams
Length over all	4¾ in.
Depth	3⅛ in.
Capacity of magazine	6 shots
Weight of powder	2 grains
Weight of bullet	8 grains

DIRECTIONS FOR USE OF WEBLEY POCKET AUTOMATICS.

To Load.

Place hammer to full cock and withdraw magazine, load up the latter with the cartridges, and replace in butt, pull back breech slide to full extent and release sharply. This will load the first cartridge from the magazine into the barrel, raise safety bolt until it covers the word "safe," the pistol is then ready for use. On pulling the trigger, the cartridge in the barrel is fired, the empty shell ejected, and a fresh cartridge loaded automatically from the magazine into the barrel.

Directions for Taking Asunder.

Place hammer at full cock, press down safety bolt until the word "safe" is exposed, withdraw magazine, place finger through the bow of trigger guard, pulling it towards the muzzle of barrel until it is freed. The barrel and breech-block can then be withdrawn from breech block. This is as far as it is necessary to take the pistol asunder for the purpose of cleaning under ordinary circumstances.

N.B.—To Prevent Accidents. Before dismounting pistol care should be taken to see that no cartridge is left in barrel.

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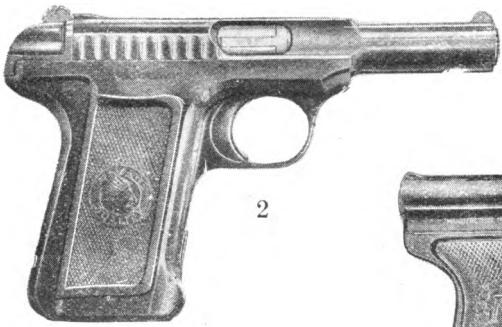
PLATE VI

Pocket Pistols



1. Steyr ·32 Pocket Model. 2. Savage ·32 Pocket Model.
3. Le Francais ·25.
4. Vernez-Carron ·25. 5. Venus ·32.

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To Re-assemble.

Place barrel in position in breech-block, insert the sleeve in the grooves of the body of pistol, and push both barrel and sleeve backwards (towards the hammer), and press the guard home.

Unless the guard is properly positioned and the barrel, body, and sleeve perfectly level, the pistol will not work.

The *Savage* ·380 auto and ·32 auto pistols are excellent pieces of design, and are remarkably popular in the States. Their chief virtue is that the grip is so well designed and the barrel level so low in the hand that they are easy to shoot with, even in the hands of a novice. In addition, it holds ten cartridges (·32 auto) in the magazine and one in the chamber as well, thus giving a total of *eleven shots in hand.*

Nearly all other pocket automatics rely upon a heavy breech-block, not locked to the barrel but having such inertia and excess of weight over the bullet that the latter has left the muzzle long before the breech commences to move. The principle is quite sound and reliable, but it often means weight unevenly distributed, a fault in most " blow-back " types of automatics.

In the Savage, use is made of the rotary or twisting motion of the bullet against the rifling. This tends to twist the barrel, and the mechanism is so contrived that while the bullet is passing up the barrel its movement *is practically screwing the barrel and breech bolt tight together.* The instant the bullet is clear this twist ceases to affect the barrel and the rearward impulse of the recoil, and the pressure of the blast gases upon the nose of the slide forces the slide back, turning the barrel to its unlocked position and allowing the bolt to separate from the breech. In actual practice it is difficult to determine whether the rotary " locking " device claimed by the Savage does actually lock, for the barrel is a fixed member incapable of movement backwards or

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forwards, and it might be better described as a "delaying device," which works well.

The Savage pistol is full of excellent ideas, and the workmanship throughout is first class, it is perfectly easy to dismount without the use of tools, all parts are interchangeable and the pull-off is very sweet.

The features of the magazine lead are unusual, and contribute to make jambs less common than is customary with automatic pistols.

The wings on the magazine lead the cartridge toward the chamber, the bolt-head is recessed to take the head of the cartridge, and the frame has a special grooved incline to guide the nose of the bullet.

A convenient safety is fitted, and the extractor (as in the Parabellum) serves as an indicator to tell whether there is a cartridge in the chamber.

The pistols are made both in hammer and hammerless styles, and are extremely accurate. So far no ·25 model or miniature has been put on the British market, though I understand that at one time the firm were experimenting with them.

The ·380 Savage Automatic Pistol.

The ·380 calibre Savage pistol has all the advantages and all the strong features of the ·32 calibre arm and greater stopping power.

It uses the ·380 automatic pistol cartridge and the 9 mm. Browning short cartridge (different names for the same cartridge), and is the only pistol using this cartridge which claims a positively locked action. All the other pistols using this cartridge are of the straight blow-back type with unlocked breech, and the makers claim that the ·380 gives better results in their pistol than in any other type, but no ballistic evidence has been adduced in support of the claims. The cartridge has been considered neither especially accurate nor

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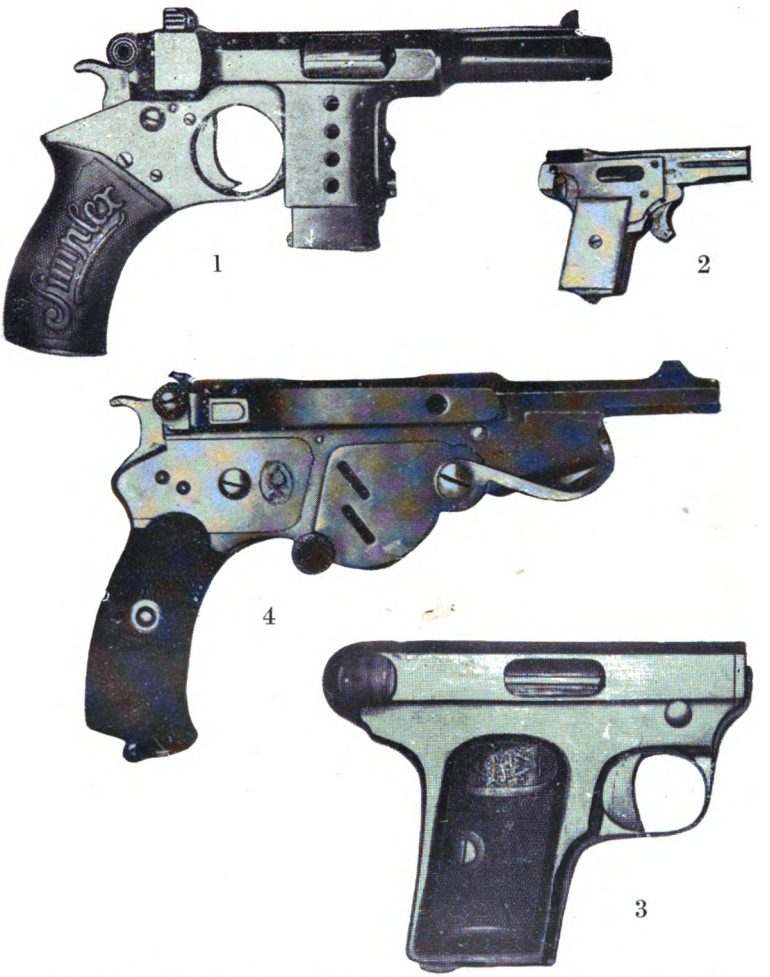
PLATE VII

Pocket Pistols



1. ·32 calibre " Simplex " Pistol. An early automatic with a box magazine in which the cartridges lie " staggered " as in the later Savage.

2. 2 mm. calibre "Colibri " pistol. The smallest automatic made. Full size length, $2\frac{3}{4}$ inches. It fires a special centre-fire cartridge with nickel-covered bullets. Although a toy it penetrates an inch or more of wood and can be used with deadly effect.

3. The Fiel pistol. French ·25 calibre vest-pocket model.

4. Late model pocket Bergmann ·5 mm. calibre (·196″). Folding trigger clip loader.

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powerful, but is quite suitable for the limited purpose that arms taking it are required to fulfil.

The mechanism and outlines are exactly the same as those of the ·32 calibre Savage pistol, the arm is operated in the same way, and the instructions for operating the ·32 apply equally well to the 3·80. The pistol is ½ in. longer than the ·32, being 7 in. long over all. The length of the barrel is 4½ in., and the magazine contains nine cartridges which, with one in the chamber, make the ·380 a ten-shot pistol.

To Dismount Pistol.

To dismount the pistol, first remove the magazine, then retract the bolt to its rearmost position, and holding it there, raise the safety to "safe," which will prevent the bolt from going forward. This may be done by taking the pistol in the right hand so that the muzzle will point across the operator's body to the left. Push the bolt clear back with the left hand and raise the safety to "safe" with the thumb of the right hand. Another way is to hold the pistol with the right hand in the usual manner, and pull back the bolt with the thumb and forefinger of the left hand. When it reaches its rearmost position, raise the safety to "safe" with the second finger of the left hand, which is in position to do this conveniently.

Unless the operator intends to give the pistol a very thorough cleaning, he need not continue the dismounting operation but may clean the barrel by introducing a brush or cloth saturated with good oil on a cleaning rod from the muzzle. This should always be done as soon as possible after firing the pistol, and the arm should never be allowed to go over night after shooting without having the barrel cleaned and oiled.

It is not necessary to proceed further in dismounting the pistol for the purpose of cleaning, but if desirable to do so it can be completely dismounted.

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If it is not desired to dismount the pistol after wiping out the barrel, push the safety down to " fire," and the bolt will snap forward, leaving the pistol ready for the insertion of the magazine. When the pistol is not in use, it should be left uncocked.

To Remove the Breech Plug.

When the bolt of the pistol has been retracted and is held back by the safety, as described above, the breech plug may be removed by pressing in the head of the cocking lever, as far as it will go, and, while pressing it down, turning the breech plug one-quarter turn to the right and then pulling it straight back. The cocking lever is held down and back most easily by putting the first finger of the right hand on top of it, and the thumb underneath the plug and squeezing it. Then, still squeezing, turn the breech plug one-quarter turn, and pull back.

To Remove Bolt and Barrel from Frame.

After removing the breech plug, take the pistol in the right hand, and, *being careful to hold back the trigger and not to release it until the bolt is entirely off the frame,* take hold of the bolt firmly with the left hand, and throw down the safety with the thumb of the right hand. Then allow the bolt to move slowly forward until it is entirely off the frame. This releases the retractor spring, which is between the barrel and the bolt, so that it may be drawn forward off the barrel.

After the bolt and barrel have been removed, the trigger may be allowed to go forward, which will release the scear-trip catch and permit the scear trip to fly up. The trigger mechanism may be taken out by raising the scear trip to a vertical position and moving it to the left, where it may be lifted out of the frame together with the trigger. Every part of the pistol is now ready, accessible for the most thorough cleaning, and it will

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probably never be necessary to dismount the arm any further.

The pistol may, however, be further dismounted as follows: To dismount the scear-trip mechanism, turn the scear-trip catch one-quarter turn in either direction. The scear-trip catch and scear-trip lifter can then be removed from the scear trip.

To Dismount Breech Plug.

To dismount breech plug, first remove the extractor and extractor spring by pulling extractor straight out from the side and then removing the spring from the recess in the plug.

Then, holding top of cocking lever and bottom of breech plug between forefinger and thumb in the same way as described above for removing breech plug from bolt, press the arm of the scear located at the front end of the breech plug and allow cocking lever to move forward slowly. Then push out cocking-lever spring.

After cocking lever is removed, push the lower arm of cocking lever forward, which will push out firing-pin spring retainer (push out firing-pin spring retainer from underneath).

The cocking lever, firing pin and firing-pin spring may be removed by drawing cocking lever directly back through the aperture at the rear of the plug. The scear may then be pulled out from the plug and scear spring removed.

To Assemble.

To assemble breech plug, first put the scear spring in position and then put in the scear by first placing the rear end in the opening on top of the plug, and then turning or rocking the scear into place. Then push the lower arm of the scear rearward, and holding it so, slide firing pin, with spring and cocking lever, into the breech plug from the aperture at the rear into their extreme forward position.

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Then insert firing-pin spring retainer, being careful to get it entirely behind the rear end of the firing-pin spring. To do this, press head of cocking lever back. This will cause the lower end of cocking lever to push the rear end of firing-pin spring forward, so that the retainer can be slipped in behind it. Push in the cocking-lever pin; put the extractor spring in its aperture and replace the extractor, putting its rear end in first and then swinging its forward end around in place.

To assemble trigger mechanism, insert the scear-trip lifter in the scear trip, rounded end first. Then insert the scear-trip catch-spring and scear-trip catch, giving the latter one-quarter turn to lock. Insert the pivot at the lowest end of the scear trip into the opening at the front end of the trigger on the trigger's left-hand side. Be sure that the little trigger spring is in its hole in the rear of the trigger.

Now place this group in the frame by allowing the trigger to drop through the slot into its position in the trigger guard. See that the scear-trip pivot does not extend beyond the right-hand side of the trigger. Slide the scear-trip slightly to the right and press it down into its recess in the frame. *Then pull back the trigger and hold it back.* This will cause the scear-trip catch to engage, and will hold the scear trip down, and the *trigger should be held steadily back and not released until the barrel and bolt have been assembled on the pistol, the bolt retracted to its rearmost position and the safety raised to "safe."*

Put the barrel in position on the frame with the wide lug in the transverse slot, or recess, and the narrow or locking lug uppermost, and turn slightly to the left. The barrel may be held in position by means of the first finger of the left hand, the second one being employed holding back the trigger.

Place the retractor spring on the barrel, and then slide the bolt back outside the barrel and retractor

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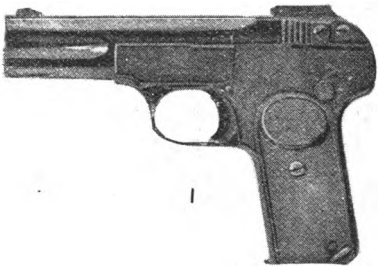
PLATE VIII



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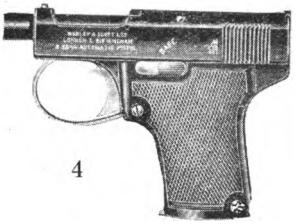

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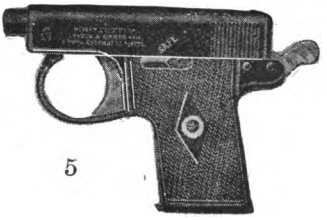

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1. Browning ·32 Old Model. 2. Browning ·32 New Model.
3. ·25 Colt.
4. ·25 Hammerless Webley. 5. ·25 Hammerless Model Webley
6. ·32 Bayard.

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spring, engaging the bolt in the guide grooves on either side of the frame, and the safety being down, slide the bolt rearward over the barrel and retractor spring and along the grooves in the frame to the rearward end of its travel. Hold bolt in that position and turn up safety to " safe," which will lock the bolt in its rearmost position. Then the trigger may be released and the breech plug inserted.

It is necessary to press down the top of the cocking lever and to put the plug in on its right side and then give it one-quarter turn. In replacing the plug, be careful that the firing-pin spring retainer is fully pressed down, and is not protruding so as to cause the plug to stick. Also, be careful to give the plug exactly one-quarter turn to the left so that the guide ribs on the bolt and on the breech plug will align.

Then throw the safety down to " fire," which will allow the bolt to snap forward and the pistol will be ready for the insertion of the magazine.

The Browning Pistols. The Browning pistols are made by the F.N. Company, of Herstal, near Liége, and the same patents are used by Colts under licence. Brownings are not allowed to be imported into the U.S.A. for this reason.

The old model ·32 was the Browning pistol of revolutionary fame. It was a very fair arm, accurate, cheap, easy to manufacture, and over a million were sold, but it has been superseded by the new model ·32 or 7·65 mm., which is smaller and handier, but has a much more appreciable recoil. The New Model is made in two calibres, ·32 and ·380 auto (9 mm. Browning, *short*). The pistols are the same size, 6 in. over all weight, 20 oz. The old model was 7 in. long and weighed about 24 oz. and held seven shots.

In the new model the separate recoil cylinder and spring set over the barrel was done away with, and the recoil spring is coiled round the barrel similarly to the

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Savage system. The ·32 holds seven shots, the 9 mm. six.

At present these pistols are unobtainable owing to the occupation of Belgium by the Germans, and after the war it is probable that still newer models will be issued as soon as the famous factory can get started again. Since the foregoing was written the Baby Browning is once more upon the market.

The Baby Browning, ·25 auto calibre (6·35 mm.), is very well known and very reliable. It is almost identical with the Colt ·25 in style and mechanism but lacks the better finish of the Colt factory.

It weighs 14 oz. with loaded magazine and measures 4½ in. over all.

All Browning arms are marked on the grip with the letters F.N.

Smith and Wesson Pocket Automatic. The well-known revolver firm of Smith and Wesson made a ·35 calibre automatic pistol, which is somewhat similar in external appearance to the old model Browning ·32 auto. This pistol has had no sale in Great Britain, and little circulation in Europe, because of the odd size cartridge for which it is made; a nominal ·35 having a bore of ·301, and being less powerful than the common ·32 auto.

It appeared at a time when reliable automatic cartridges of accepted calibres were on the market, but its design is such that even with the established automatic cartridges of ·32 and ·30 calibres it would probably have been inferior to other pistols. In any case its virtues have not been sufficiently apparent to enforce the new ·35 cartridge on a reluctant public, and as it is not much use buying pistols whose efficiency is dubious and whose ammunition is not stocked by gunsmiths, I cannot advise anyone to buy the weapon in question.

Harrington and Richardson. The American firm of Harrington and Richardson make a ·32 automatic and vest pocket ·25 model. The general appearance of

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these pistols is similar to the Webley's, but their internal construction is different. The Webley ·32 has its recoil spring in the hollow of the right-hand grip. The H.R. recoil spring is held in a recess of the breech frame above the breech block.

The finish of the weapons is good and the workmanship irreproachable, but they have not long been on the English market, and it is too early to form a considered judgment of their reliability or desirability.

The products of the H. and R. firm are as a rule, perfectly reliable and very good indeed for their low price, but up to now their revolvers have been medium-priced, medium grade articles, not entering into competition with the higher priced first quality English and American arms. Their automatic pistols are a new departure, and their reputation will be established by their achievements if these are as good as their appearance.

Bayard Pistols. The Bayard pocket model is a very good Belgian pistol of extraordinary compactness, made by Piepers, of Liége. It is 4¾ in. over all, and weighs 16 oz., but in place of firing the ·25 small calibre cartridge chambers the ·380 or ·32 automatic holding five in magazine.

These pistols were rapidly rising in public favour before the war, for they were well made and powerful, and despite the light weight and heavy charge were not unpleasant in the recoil.

The *Ieffeco* is a Continental made pistol of ·25 and ·32 calibre, somewhat similar to the old model Browning in appearance. It is not a weapon of importance and was cheaply made.

Pieper. The Pieper is a Belgian-made hammerless pistol with a very comfortable grip and an easy and smooth trigger action. Individual weapons varied between wide limits both in accuracy and in reliability, but some specimens perform very well.

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It was made in two sizes to take the ·32 auto and in a vest pocket size for the ·25. The outstanding point in design of these weapons was their extreme flatness in the pocket, and the ·25 and ·32 calibres took respectively eight and seven cartridges in the magazine and weighed 17½ and 19½ oz. They are medium-priced weapons, and bear the initials N.P. (Nicholas Pieper) on the vulcanite grips.

Clément Pistols. The Clément was a Belgian hammerless pistol of ·25 calibre, it was midway in size between the average ·32 and the ordinary vest pocket model, and held eight cartridges. It was not in any way remarkable.

Steyr. The Steyr (1909 model) was a hammerless Continental pistol in ·32 and ·25 calibres, designed by Pieper, and made at the celebrated Mannlicher works at Steyr, which was fitted with a spring tilting barrel on the breakdown principle. This barrel was operated by a side lever on the left side within reach of the thumb and was designed so that the weapon could be conveniently used as a single loader as well as a magazine pistol. No extractor was fitted, the recoil and gas pressure ejecting the empty case perfectly.

The ·32 weighed 22 oz., held eight shots, and was well seated in the hand. The ·25 weighed 12 oz., held seven shots, and was too small for a good grip. As single loaders they were not bad, but the magazine action was distinctly unreliable. They were remarkable for their good design, and were easy to clean and dismount. When used as a single loader, the recoil spring did not have to be compressed when cocking, the action for breaking down severed the connection between breech and retractor spring.

The Mauser. The well-known Mauser firm made a hammerless ·25 auto, but it is large for its calibre, unduly expensive, and presents no marked advantages over other arms of similar calibre. As is usual with weapons of this make, the workmanship, quality of

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material and finish were good, but the arm was not distinguished by any particular virtues of reliability, though it was very accurate owing to its low barrel. In most of these weapons the trigger pull was decidedly sweet and they were easy to shoot with. During the war they have made a ·32 pocket model very little larger than the ·25 and on the same principle. It is a simple blow-back action arm with all parts dismountable without tools and is a very creditable piece of design and a good up-to-date weapon.

Roth-Sauer. The Roth-Sauer is a peculiar pistol, sometimes met with in Germany and the States. It fires a special ·32 cartridge rather shorter than the usual ·32 auto, and is a clip loader. It is made on bolt action lines and has rather a good reputation for reliability. The bolt and barrel recoil together for a long distance in the larger models, but the ·32 is not cumbersome. So far as Britian and most parts of the world are concerned, it is not worth getting because of the odd-sized cartridge.

I have not used the weapon myself and cannot speak of its performance except from hearsay. I have handled one or two, and they seem well made and interesting pieces of design, but now obsolete.

The *Fiel* is a French vest pocket hammerless ·25 automatic of extremely simple design. The recoil spring is laid in a recess along the top of the bolt and a spring striker is employed. The weapon is very reliable, has very few parts, and represents a striking simplification of the automatic.

To remove the barrel a stud is revolved, and the barrel drawn out clear of the casing in one movement. A half turn of the stud serves as a safety as well, as it locks the trigger bar. It has no sights but a groove along the top rib of the frame, which is rigid, but the grip is well shaped and the pistol handles so well that for its purpose sights are not necessary.

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The *Verney Carron* is a French pistol of ·25 calibre with a seven-shot magazine, and resembles a modification of the Mannlicher ideas. The breech-block is attached to a recoil slide working beneath the barrel. The safety device is elementary but reliable, consisting of an interesting member which interposes between the nose of the hammer and the head of the firing pin, the external hammer is easily cocked and conveniently placed. This type has been extensively copied in Spain in very bad material and workmanship.

The *Victoria* is a Continental imitation of the ·25 Browning and Colt ·32 models, it is crudely made, very badly finished inside, and though occasional pistols of this make shoot very well, cannot be recommended.

The *Star and Express* pistols, made in Spain, are quite inferior pistols and not to be recommended. (See chapter on Intermediate Arms.)

The automatic pistol, known as *Le Français*, and made by the Manufacture Française d'Armes et Cycles de Saint Etienne, is an excellent instance of a good class Continental made weapon with outstanding points of sensible design about it. In this weapon the good points of a double action hammerless revolver lock, and the speed of an automatic system of reloading are combined.

The trigger action is separate from the recoil action, and the arm is cocked and fired by trigger pull alone. This principle makes for a marked advance in the safety of a pocket weapon as in the usual way the hammer is never cocked and so cannot be jarred off by a fall or knock.

In addition to these virtues the barrel tips up so that the weapon can be readily used as a single loader, and is very easy to clean. The magazine holds seven cartridges, and at present the weapon is only made in ·25 auto calibre.

This pistol has such a marked factor of safety in combination with so many desirable features that it is

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to be hoped that after the war it will be made as a first-class arm in larger calibres.

The Schwartzlose. This pistol is one of the very rare types of weapon in which the barrel and slide move *forward* from the frame instead of backward. The earliest Mannlicher semi-automatic had a similar principle of forward moving barrel, but the earlier types of Schwartzlose were on the normal systems.

The pistol is a pocket model ·32 calibre, seven-shot weapon. Weight, 19 oz.; over all length, 7½ in. It is hammerless and provided with a grip safety placed on the forward side of the grip beneath the trigger guard. This safety, besides being unusually positioned, has also the novel advantage of a catch so fitted that it can be held off or on at will.

The ballistic questions raised by a pistol which fires its bullet, barrel and slide against the first resistance of a spring, then the frame held in the hand of the firer produce some complicated issues, but apparently the Schwartzlose utilizes in its functioning not only the normal recoil energy but also the forward drag of the bullet engaging with the rifling. The pistol is an interesting mechanism that provides novel principles to be investigated by designers. Its ballistic value is unascertained at present.

The *Dreyse* is a German pistol on the familiar old model Browning lines. It is made in ·32 auto and ·25 calibres, seven- and six-shot magazines. Possesses no marked advantages.

The *Walther Selbstlade* pistol is a pocket automatic of 6·35 mm., six shots, German manufacture. There are one or two models that differ slightly but none are of outstanding merit.

The *Warnant* is a Belgian weapon, seven shot, 6·35 mm., not remarkable.

L. E. Meteore is a similar pistol.

The *Monobloc* is a vest pocket weapon of 6·35 mm.

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calibre, six shots in magazine. The barrel and frame are milled from the solid, but neither design nor workmanship are remarkable. Manufactured in Belgium.

The *Frommer* is an Austrian pistol of forbidding appearance. It holds nine ·32 auto cartridges and has a grip safety. Barrel recoils with bolt but the mechanism is too complicated.

The *Venus*. A German pistol, 6·35 mm., seven shots. Reputed designed for accuracy, and also made in ·32 and ·380 auto sizes.

Elez
U.A.E.
Walman
I.G.
Destroyer
Victoria
Kappora
Star
Vincitor
Royal
Imperial
and others

These are Spanish pistols, remarkable for the variety of their names, the similarity of their appearance and the indifferent quality of their material and workmanship. Some are external imitations of F.N.'s, some of French pistols, many are copies of one another.
The Star and Victoria are possibly the best of the batch.

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CHAPTER VI

HOW TO SHOOT

BEFORE you can learn to shoot and before you are fit to fire live cartridges you must learn the correct way of handling your weapon, how to load it, how to cock it, and be familiar with its pull-off and functioning. Remember that an automatic is a more dangerous weapon in a learner's hands than any revolver or pistol, for one cannot see (in most makes) whether it is loaded in the chamber even if the magazine has been withdrawn.

Besides examining the magazine make it an invariable rule to open the action, and make sure that there is no cartridge in the chamber.

More accidents have occurred through neglect of this elementary precaution than any other failing of automatics or their users.

Having loaded the magazine, place it in the grip, carefully pushing it home till it engages with its catch and *not* slamming it in. Roughness is likely to injure the top of the magazine guides and jambs will result. Half the causes of jambs and bad feeding of cartridges from magazine to chamber arises from slight bending or distortion of the magazine lips. Spare magazines can be bought at reasonable prices.

Loading the first cartridge from the magazine into the chamber is effected by drawing the slide back with the left hand and holding the pistol firmly (*with fingers clear of the trigger and outside the trigger guard*) in the right hand.

Draw back the slide to full extent and let it fly forward sharply, this will carry the first cartridge into the chamber and the weapon is ready to fire.

This movement is easily attained but needs a certain

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knack. The novice should practice with an empty pistol with the magazine withdrawn until he can safely accomplish the movement. During this loading operation the barrel should be ***kept rigorously pointed down the range*** and toward the target.

Never turn round to speak to a neighbour, turning the pistol toward him unconsciously as you do so. It is a fatally easy and very dangerous thing to do.

Some automatics remain open when the last shot has been fired, a fresh magazine is then put in, and by pressing down the side safety the action closes automatically. Till accustomed to the weapon it is better to close the action when it is empty and load in the ordinary way.

The recoil of an automatic pistol is partly absorbed in doing the work of reloading, but there is still a large amount of recoil or " kick " which has to be borne by the shooter, nevertheless, the heaviest charges can be fired repeatedly after a certain amount of practice, for the muscles of the arm speedily accommodate themselves to the tension.

The weapon should be gripped high up with the thumb well extended to prevent canting to the side. The grip should be firm but not too rigid; no more force should be used than is necessary to hold the weapon steady, and the recoil should be " caught " just as a cricketer catches a ball.

The biggest trouble to beginners is " flinch," due to nervous reflex in anticipation of the explosion. Flinch can only be cured by practice and steady concentration of the mind on correct ***holding on*** both when the trigger is pressed ***and after***.

Steady snapping practice with an unloaded weapon will help you to master this, and should be persisted in till a good steady pull off is attained.

The rules for pistol shooting are equally suitable to all types and calibres of weapon, irrespective of make,

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but the first essential is that the pistol should be a good one. It is more difficult to shoot accurately with an automatic pistol than it is with a revolver, though the novice often makes better practice with the former at the start.

The disadvantages of the automatic compared with the revolver for shooting are largely those of design, for the sighting of most automatics has been sacrificed to the need of making a handy and portable weapon, and the sights are small and badly placed. Some of the smaller pocket pistols sights are so stunted as to be practically valueless, and in some models a groove along the top of the slide is all that is provided. Now, small weapons if of good quality, such as the Colt, Webley, or F.N. ·25, are capable of surprising accuracy if a little care is bestowed upon them, but they are not sent out from the makers as carefully sighted as target arms, and need fresh sights fitting and a certain amount of money and time spent upon them.

The small ·25 vest pocket automatics are not meant for target work but are designed for self-defence at close range. Nevertheless, they can be made into very accurate little pistols, and their general stockiness and solidity make them fairly robust weapons capable of standing a lot of knocking about. If it is desired to improve the standard model so as to have a specially accurately adjusted and suitable target pistol of miniature dimensions, the first thing to do is to have the frame straps and trigger roughed so as to give a better grip, as without this the small stock tends to slip in the hand. The trigger-pull should be adjusted to a light pull, certainly not under four pounds, as automatics will not be reliable with the lighter pulls suitable for revolvers, and the whole of the moving parts of the trigger gear should be perfectly smooth in working and free from play. To achieve this it is necessary to go over all the parts, both fixed and movable, using a

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fine stone to polish off any trace of burr or roughness that may account for the creepy action of the pull.

In many automatics both the pull and the trigger movement are excessive. The trigger has to be pulled rather than pressed, and has to travel far before it frees the scear from bent. In some pistols it is worth while making a new and longer trigger-bar out of a piece of good steel in order to get a shorter travel and a perfect fit, but this is, in most cases, an unnecessary refinement. In the ·25 Colt the trigger pull can be improved if the firing pin is a *perfect* fit in its groove.

The military model pistols have fair sights but these are by no means the best. Unfortunately the foresight is usually solid with the whole barrel slide, and alterations are a tedious job. The best foresight is the common bead-pattern hunting sight set fairly low. This can be made out of the normal foresight by the careful sweating of the "bead" to a flat filed on top of the existing foresight, or a better job can be made by setting a base on to the slide above the foresight and mounting the usual bead upon it in the way such sights are set on sporting rifles.

In some weapons the slide can be slit axially and a suitable foresight sweated in. This method is suitable for the smaller pistols as it does not weaken the slide.

All automatic foresights should be made strongly, and the bead should not be deeply undercut so as to bend easily. They should not be made easily movable if they are to be fitted upon a slide, as the recoil jar constantly puts them out of adjustment.

The Webley and similar pistols, with a foresight milled on the barrel, are easier dealt with, but in all cases the work should be carried out by a competent gunsmith or the appearance of the weapon is likely to be spoilt and its accuracy impaired. Mr. Churchill, of Agar Street, Charing Cross, can be recommended

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as a gunsmith who thoroughly understands all types of pistol.

Rear sights are usually adjustable in a lateral direction and should be tapped into alignment with a copper-tipped hammer. Some models have a fixed rigid sight. If it is desired to alter this a new sight, suitable and proportional in height to the foresight, must be dovetailed into the metal. In those types where an adjustable rear sight is the standard fitting it is easy to cut a new but higher back sight to correspond with the new foresight and seat it in the old slot.

A good combination of sights for most automatics is an ivory or silver-tipped bead foresight and a back sight with a half-round notch. A globe foresight is very convenient for target work but rather spoils the weapon for quick alignment and swiftness in drawing from a holster.

The sights of the Parabellum are very good, the big wedge foresight is easily picked up and centres well in the deep V of the back sight, while the milled serrations on it make it easy to see the same amount each time. The foresight setting on this weapon is decidedly convenient as it allows for the use of different types of sight and Lymans make a bead sight in ivory, gold, or silver (No. 31) which fits it.

The Colt ·22 automatic is designed for target work and has excellent sights, an adjustable bead foresight, and a traversing rear sight. These are quite strong enough for ordinary use and do not get out of adjustment easily.

For general purposes the ordinary bead foresight, used in conjunction with the plain notched back sight of suitable height, should give excellent results and stand all normal rough-and-tumble use. For purely target work there is no reason why the best forms of target sight, as used on single-shot pistols, should not be used on the automatic pistol for they can be fitted

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to nearly any make without weakening the weapon at a vital point.

Assuming that you have a suitable pistol, accurately sighted and adjusted, in shooting with an automatic there are three cardinal points to remember—

1. Do not *cant* the pistol but hold it perfectly level, so that the bubble of a spirit level set across the barrel would rest in the notch of the back sight.
2. Squeeze the trigger—do not snatch or pull at it.
3. Take the same amount of foresight every time.

The greatest difficulty with automatics is the difficulty of holding them level. If the barrel is canted to the right the bullet will go low right, if to the left low left.

The trigger pull in an automatic is harder than with a good revolver, as a result there is a tendency to " pull off " the bull due to unequal tension of the muscle of the trigger finger. Practice should be carried out with an empty pistol as follows: Align the sights at the bottom edge of the bull. Hold the pistol *level* and steady, gradually tighten the grip of the *whole hand*, transmitting the pressure gradually to the trigger finger till the hammer falls.

The novice will find that with the low foresight fitted to most automatics it is difficult to be certain of seeing the same amount of foresight in the backsight notch each time, and in some makes the foresight is so small as to be useless and sunk so deep in a groove on the side that most beginners tend to disregard the back sight and centre the foresight and the muzzle end of the slide upon the bull. Accurate shooting under such conditions is hopeless—either get a pistol with sights or have proper visible sights fitted to the one you own.

The reason that small pistol automatic sights are so small compared to revolver sights of similar small calibre weapons is attributed by some people to the

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reduced muzzle jump of an automatic as compared to a revolver, but is mainly a matter of design, the weapons being meant for pocket use or self-defence work at big targets and the sights put on as an aid to relative accuracy rather than exact shooting.

Assuming that the pistol is well and correctly sighted, the usual rules of rifle and revolver shooting apply to the automatic pistol, and the whole thing is summed up thus: The acquisition of a reliable pistol, a correct style, and plenty of practice ***with the same weapon.*** Know your pistol—that is the real secret of success.

In learning to shoot, a beginner should map out his course in a series of practices or lessons, and besides his actual practice on the range carry out empty or snapping practice at home. The secret of good shooting is practice and familiarity with the balance of your weapon, and this applies just as much to steady target shooting as it does to speed shooting.

Before speed shooting can be attained the novice must be more or less familiar with ordinary slow target work.

LESSON 1. With an empty pistol familiarize yourself with the working of the weapon. Learn how to load, how to apply and release the safeties, how to insert and withdraw the magazine, and, if it is an outside hammer model, how to lower the hammer on to the chamber without letting it fall.

LESSON 2. ***Aiming and Cocking Practice.*** Cock the arm and take aim at the target. The body should be free, the right shoulder advanced, and left hand on the left hip, and the feet a comfortable distance apart. An easy, unconstrained position is essential. If firing with the right hand, close the left eye fully or partly and aim with the right eye. Some people prefer to shoot with both eyes open, but a beginner had better close the left, if it can be done without effort.

In practising at home, a disc of black paper, 1 in. in

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diameter pinned against the wall, level with the eye, makes a good aiming target.

Hold the pistol level with the top of the foresight level with the top of the back sight, and central in the back-sight notch. The tip of the foresight should just touch the bottom of the bull's-eye.

You will find it almost impossible to hold steady, and will find your sight wavering round erratically across the bull and up and down. This is natural, for it is impossible to hold perfectly steady, though with practice one becomes much better.

Squeeze the trigger when your sights are just about to waver across the bull. A good shot learns to anticipate the exact moment when sights and aiming point will swing into alignment, and starts pressing the trigger so that the hammer falls *just as the correct aim occurs.*

Learn to *press* the trigger—never snatch or pull at it, for anything but a gradual slow squeeze throws the aim entirely out. Continue this till you can get a steady pull-off with an unloaded pistol.

LESSON 3. At the range, load in a charged magazine and remember to keep the pistol muzzle always pointed down the range. Draw back the slide cocking the weapon. Start on the short-range 12-yard target, aim as in previous practices, and fire.

Rest and lower the pistol to the bench after each shot, and if the hand is quivering from the recoil, rest till it is normal again.

Repress all tendency to flinch from the anticipated explosion—the pistol won't hurt you and there is no need to fear the bang.

For a first practice, two magazines should be sufficient.

After firing, learn to clean your pistol yourself.

LESSON 4. Take the pistol apart for cleaning according to the instructions issued with it. Practice aiming and snapping at home.

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LESSON 5. Fire two magazines at the short-range then one rapid fire at the same range.

LESSON 6. If you have had enough success at the short-range, fire one magazine at the 12-yards to get you eye in, then move to the 20-yard and do a slow, deliberate shoot at the same sized target as you have been using on the short. After firing a shot always bring your pistol back into alignment with the bull before lowering it to the bench. This will help you to learn to "hold on" without conscious effort, and it is one of the most important aids to learning quick accurate shooting.

After this the novice must elaborate his lessons and training to suit himself. Discover your pet faults—wrong-handling, flinching, bad trigger-pressing, dwelling too long on the aim, or whatever it is, and set yourself sedulously to correct it. Your physical and nervous condition will probably affect your shooting, but the best shots are not, as a rule, either non-smokers or total abstainers. Excess of any kind, of course, affects shooting badly.

When you have got proficient in ordinary slow shooting it is time to take to the more useful speed work.

One of the advantages of the automatic pistol is that it holds more shots and is quicker to fire than most revolvers. It is this speed that attracts many people to it, but in point of fact the large bore automatic are not speedier than the revolver when the latter is in equally expert hands.

Given two shots of equal speed and ability the big double-action revolvers can be handled practically as quickly as the automatics. In any case the difference between them is but a matter of fifths of a second.

Speed in pistol shooting is largely determined by the smoothness of the trigger working and the recoil disturbance of the particular weapon used. The heavier the pistol and the lighter the charge the less disturbance

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of aim due to recoil. Now, the ·380 automatic is a quicker weapon than the ·45 auto, for the heavier charge throws the aim off farther, and time is lost in recovering from the recoil and re-establishing the alignment.

The ·22 auto is probably the speediest weapon extant, as its recoil is the lightest and it has an easy trigger pull, but its small calibre makes it of little value as a *weapon*.

Taking an average estimate of the performance of pistol shots, who are really expert quick shots, and selecting from some of their published and witnessed shoots.

A very good expert shoot is—
Target, 12 in. × 20 in. (vertical). Range, 10 yds.
Pistol, ·380 Colts Auto. Time, 1½ secs., 8 shots.
Hits on card, 5. Group, 7½ in.

Contrast this with a similar shoot with a Colt revolver—
Target, 12 in. square. Range, 12 yds.
Average of ten consecutive shoots.
Pistol, ·38 Officers model, 6½ in. barrel. Time, 1½ secs.
per six shots. Hits on card, 5·1. Group, 8 in.

This shows little between the two.

With the larger automatics the time is slower and the revolvers show an advantage. Conversely the smaller calibre automatics are speedier than the small revolvers.

These fractional differences in speed are not of great importance by themselves, but speed in pistol shooting is relatively more important than precision, for the pistol is essentially a self-defence weapon.

There are practically two schools of pistol shots, the one the slow target shot of exquisite precision, the other the speed shots who, while not despising accuracy, treat the pistol as a weapon rather than as an instrument. The happiest combination is the man who excels at both, but for the average man it is more important to

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be certain of hitting a man five times in as many seconds when he is, say, 20 yards away, than it is to be capable of making a possible within a 2 in. ring, firing at long intervals of time and at the same distance.

Pistol shooting should be automatic. The weapon should direct its bullet to the mark as naturally and swiftly as one points the finger, and the operation of aiming should be instinctive—almost sub-conscious.

This condition may be largely attained by practice, continual steady practice, and with the same pistol. If you vary your weapon you bring a fresh set of muscle movements into play, and the "instinct" handling has to be learnt all over again.

Once a certain control has been gained it is possible to shoot well with many pistols, as the trick once learnt is, like swimming, never forgotten; but while learning stick to one type of pistol and practice sedulously with that.

At one time there was a widespread superstition that pistols were best used by laying the first finger along below the cylinder and pressing the trigger with the second finger.

This was a heresy (and cannot be done with automatics without grave risk of the recoiling slide nipping or tearing the finger), but was a relic of the days when every gentleman had to learn to use "the officer's weapon" and pistol practice was part of one's education in view of the practice of duelling that then obtained.

The laying of the first finger along the barrel was part of the preliminary education that taught the novice to ***aim instinctively***. From the earliest years one is able to point at an object—it was this faculty or sub-conscious relationship of the sense of sight and the sense of direction that was used to accustom the novice to pointing his pistol as naturally as he pointed his finger.

The duelling pistols used had hair triggers, and the slightest touch would fire them. The novice was

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taught to extend his first finger along the pistol, swing up or down, according to the rules of the Code Duello at the time, and as he aligned upon his target drop the finger on to the trigger. This mere touch was enough to release the set trigger and discharge the weapon.

The pistols then had a second spur trigger, or trigger-like dummy extension, outside the trigger guard; it was this dummy trigger which was held by the second finger and served no purpose but to give a steadying grip and preserve the pistol barrel in a line with the arm.

In acquiring sense of direction with a modern automatic it is an excellent thing to practice at first with the finger laid along the barrel, *but never with the second finger on the trigger.* This practice will teach the correct grip and alignment of the pistol, in a word you will get used to pointing it instinctively.

The trigger guard is usually set too close to permit the finger being slipped off the side into the guard, as was done with the old duelling pistol, but later, when you have become accustomed to the correct grip, the trigger finger will find its way instinctively into the guard and the faculty of alignment will remain instinctive.

The next point is correct trigger pressing, this also must be developed as an instinct, as jerking, linching, or pulling off are fatal to accuracy.

Correct trigger-pressing without distortion of aim should be practised continuously with the empty pistol until the *exact moment that the hammer falls is exactly as the pistol is aligned upon the target.*

Practice pointing and pressing the trigger together, so that without taking any conscious aim the movements of aligning the weapon swiftly on the target and pressing the trigger *so that the weapon fires on the instant the alignment is attained* are practically one movement.

After practising this with an empty pistol you will

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notice that after firing the alignment of the weapon is still correct—this is termed "holding-on."

After a certain facility has been attained practice looking at an object, closing the eyes, firing and holding on. Now open the eyes and note whether there is any error. Continuous practice of this nature will enable you to shoot instinctively and accurately in the dark or in bad light.

For speed shooting it is essential that the instinctive handling of the weapon should be thoroughly mastered. When one has accustomed oneself to this the instinctive muscular reflex actions, bring the pistol back into alignment after the disturbance caused by the recoil of each discharge, and it is only a matter of practice before the forearm acquires the knack of absorbing recoil with the minimum effort and disturbance, and the trigger-finger attains speed in its functioning.

After a long spell of practice fatigue is experienced in the muscles. This is purely physical, and can be reduced by continuous practice with an unloaded pistol. For this purpose an automatic is not such a useful developer as a good double-action revolver, and for developing the shooting muscles it is good to practice snapping with a double action until it can be fired sixty or more times in a minute without undue fatigue.

The muscular labour of firing an automatic is much less than that needed for a revolver, but the same muscles are in use. The recoil, too, is different, but the change of centre of gravity, due to the moving parts and the various checks of momentum as the recoil springs come into play, make the recoil of an automatic a more complicated series of shocks to the arm than the simple discharge effects of a revolver.

In all shooting, and with all weapons, *practice is the only road to success.* Physical condition, build, and temperament—all have their influences, but, generally speaking, the average man can become a perfectly

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proficient revolver or pistol shot if he give his mind to it and follows the common-sense rules and practices. A dozen shots fired on the proper lines are worth a hundred wasted in casual inattentive slapdash work, and a vast deal can be learnt with practice with an unloaded pistol in one's own room aiming at any objects that catch the eye. The whole groundwork of good quick shooting is muscle and mind training. Once acquired, it is never lost, and the later refinements of target shooting can be easier acquired on the foundation laid by practical pistol shooting for quick work at close quarters.

The great axiom of pistol shooting is this. For close objects quick shooting is all essential. As the range lengthens the time factor becomes less important, but a proficient pistol shot should be able to put six shots into a man sized target inside four seconds at all ranges up to thirty yards.

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CHAPTER VII

CLEANING AND EQUIPMENT

AFTER shooting a pistol it is essential that it should be cleaned at once, for if left uncleaned the powder residues will corrode the barrel and the pistol will soon be neither accurate nor reliable.

When smokeless powder is burnt it gives off acid gases which attack the metal of the barrel. Cordite and all nitro-glycerine powders are much worse in this respect than the nitro-cellulose powders. In addition to this the hard nickel-covered bullet tends to deposit a film of metallic fouling *over* some of the previous powder residue. As this metallic fouling is hard to see, and as it reflects the light just like a clean pistol barrel, the cleaning of automatics has to be carried out as carefully and scrupulously as if they were military rifles.

The great point to be aimed at is to clean the barrel thoroughly with some liquid which will neutralize the acid residue, then clean with a bristle brush to shift any solid fouling that may be there in the corners of the rifling, and lastly, coat the interior with a thin film of oil or gum grease to prevent rusting.

The acid residue tends to penetrate the pores of the metal so that even when a barrel has been cleaned, if it is left un-oiled, the barrel will "sweat" and fouling and corrosion will be evident a day or two after it has been properly cleaned.

Nowadays there are plenty of suitable oils and anti-corrosive cleaners on the market in which an alkaline "anti-fouling" element is combined with the oil. Kynoch's or Winchester's cleaners are excellent for this purpose. As an oil "Three-in-one" is the best of all.

In many automatics the barrel is easily removed for

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cleaning purposes. This is a great advantage over the fixed barrel revolver, as one is able to return to the oldest and best method of cleaning—boiling water. Small automatic barrels can be dropped into a kettle and boiled. Longer ones, or those fixed to the frame of the pistol, can best be got at by means of an easily-made funnel bent at a suitable angle and having an empty cartridge case soldered to its spout. The cartridge case fits the chamber tightly and prevents leakage of hot water into the mechanism.

After a barrel has been cleaned, either with boiling water, or by means of a tow pledget or flannel patch dipped in cleaner and rubbed up and down the barrel on a cleaning rod, the barrel should be thoroughly polished with a bristle brush (not a wire brush on any account). It should then be finally cleaned with a flannel or soft wool patch and carefully examined for any trace of fouling that may have escaped. Lastly, it should be oiled or greased with good gun grease.

If a barrel has been neglected and contains thick metallic fouling, it should be cleaned carefully with special cupro-nickel solvent, a preparation readily purchased at any gunmaker's, which has the virtue of removing nickel fouling. One of the best agents for removing nickel fouling is the homely "Monkey Brand" soap. A little of this on a patch will clean out all nickel without hurting the steel of the barrel.

A rusty barrel, due to neglect, must be treated to a soaking for some hours in paraffin oil (kerosene in U.S.A.), and then carefully cleaned with a wire scratch brush. The rust will come away and the pistol will be serviceable, but the places where the rust has been will remain as minute pits (one speaks of a "pitted" barrel) and will always give more trouble and need peculiarly careful cleaning. Needless to say rusted or pitted barrels do not mean accuracy. As most automatics are made on the interchangeable system it is wise to

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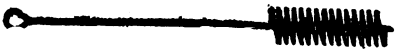
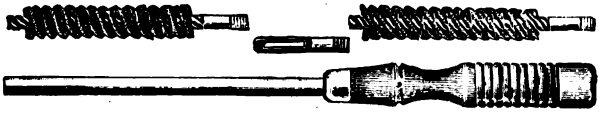
PLATE IX





Cleaning Accessories and Target Sights.

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replace a badly pitted barrel with a new one. Second-hand pistols are sometimes to be found at a low price which makes it worth while purchasing and refitting them with a new barrel. Discretion and experience are, however, needed in all second-hand pistol purchasing. The best of all barrel preservers is "B.S.A. Safeti Paste." With this little cleaning is necessary, as it makes a protective surface over the rifling and neutralizes all acid residues. It is essentially a boon to the lazy man.

The action and all moving parts should be frequently dismounted and cleaned of all dust, dirt, and old lubricant. They should be oiled freely but not to excess, and should not be allowed to become "gummy" with oil or grease. New pistols are frequently sold choked with grease, this should be removed before usage.

When a pistol is put away it should have all its springs relaxed. The hammer, or striker, should be down, and on no account should the magazines be left full of cartridges. If this is done the springs left under compression weaken and bad feeding and jambs are the natural result.

Cleaning rods should be made of soft iron or brass for small calibres, wood for large ones, and great care should be taken not to damage the rifling towards the muzzle. For general use the twisted wire and bristle pistol cleaners are excellent, and cleaner to use than having special cleaning brushes to screw on to the same cleaning rod.

Pistols should be kept in dry airtight cases rather than in leather holsters, for leather tends to absorb water and remain damp, rusting the weapon and spoiling its external appearance. Cases are made in wood or wood covered with leather or Willesden canvas. If weapons are to be kept in a house in a place accessible to servants or children they should be under lock and key. An excellent device for keeping a house pistol

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is to enclose it in a little cupboard, like a medicine cupboard, the front panel of which is made of the thinnest possible wood. In case of emergency the fist can be driven through the panel with slight effort and the pistol seized, while at ordinary times it is locked up and safe from interference.

The problem of carrying an automatic pistol in the pocket in such a way that its grip is readily accessible to the hand and so that the pistol may be drawn rapidly, is rather a complicated question, for many automatic pistols are so badly designed that they are hopelessly out of balance in a hip pocket, and the heavy magazine-loaded butts tend to sag down till the pistol is in a position which presents extraordinary difficulties for a swift draw. A revolver having its cylinder forward of the trigger guard balances well in the pocket, and the curved butt is always upright and easily grasped.

The best way is to hang the automatic in a special open leather sheath or pocket *inside the pistol pocket.* Some tailors set the hip-pocket button on the flap of the pocket, some on the outside of the pocket itself. In order to accommodate oneself to this the best way is to hang the leather open sheath from the button of the flap. If the pocket is the other type it must be secured to the flap by a big metal stud passing through the buttonhole in the sheath and through the buttonhole in the flap.

Certain pocket pistols are hopeless; they will not hang or balance decently because of the big grips and short projecting barrel, and the fact that the depth of the square butts almost exceeds the length of the whole weapon. Others with a sloped handle type and a heavy counter-balanced slide encased barrel, such as the Colt, are moderately satisfactory.

Vest pocket models can be carried anyhow in the pocket as they are too small to balance conveniently in any case.

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For Service purposes the big automatics are carried in a belt holster, and holsters for this purpose need careful design if the maximum efficiency is to be attained. A belt holster, as supplied by holster makers, is usually the least practical of devices for the line of the belt slides sewn on the back is such that the weight of the pistol tends to sag and overbalance the holster, throwing all the weight on the flap fastening.

The only decent holster made for automatic pistols by any firm of contractors that I have seen is the German Government model for the Parabellum, a type that may well serve as an example of how a holster should be made for automatics.

A Service holster for an automatic must be on different lines to the soft leather revolver holster, because the balance of an automatic at the belt is absolutely different. It must be remembered that the centre of gravity of most automatics is behind, not forward, of the trigger guard, and therefore the whole question of design must be considered from a new point of view.

An automatic holster must have a *stiff* leather back of hard or sole leather. On this must be sewn the belt loop and the line of this need not be parallel with the top of the holster but should be set at the particular angle which gives the most convenient balance and the best quick access to the particular weapon for which the holster is designed. The size of the belt loop should be a tight fit on the standard belt to prevent wobble and sagging of the holster.

So far as pistols are concerned the Sam Browne belt is about the most poisonously useless device ever conceived. A pistol to be carried on this belt should be worn on the left side, butt foremost so that it can easily be drawn with the right hand.

The only way of doing this is to scrap the sword frog, hooks, and various relics of the Victorian era that are still on the official Sam Browne belt in which officers

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go to war, and set the holster correctly in its place. As a temporary measure the belt slide on the holster can be made to fasten on two flat studs, so that it can be slipped over between the sword frog straps and then made fast, in place of being slid into place round the belt, a job that is almost impossible because of the various D's studs, hooks, and brassware on the official model.

For service use when dressed practically, and not costumed according to the Dress Regulations, it is better to wear the pistol in a stout holster hung from a belt round the waist and beneath the tunic so that it hangs low against the right thigh. For this purpose it must be in an open Mexican pattern or " Olive " holster, which, unlike all service models, has no covering flap. Such a holster, if cut for an automatic, must have the hard leather back as before specified and should be fastened down to the leg by a strap or tied bootlace passing through the toe of the holster and round the thigh. If this is not done the pistol will easily jerk out, and when running the whole holster will bump all over the place.

Spare magazines can be carried ready loaded in a slide of leather which will slip on the belt, and the holster itself should have a pocket for a spare magazine made as part of it.

The holster can be made either of webbing material or preferably good medium leather carefully welted to the hard inflexible back. It should fit well but not too tightly, and the top should be cut in such a way that the butt of the pistol can be easily grasped. Certain American holsters have steel springs inside to grip the pistol, these are ingenious but not very good in practice.

I have never found a ready-made holster really satisfactory and advise anyone to do as I do, and make a careful pattern out of stout cardboard for a backing and three or four thicknesses of brown paper pasted

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PLATE X

Holsters and Cases for Automatic Pistols.

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together for the sheath. Adjust this and cut away until it hangs and balances right, then take it to a harness-maker, together with the pistol and frighten him into making one exactly to your pattern and to fit the pistol which you leave with him. Unless you are adamant he will try to improve upon it and wreck your ideas by intruding conveniences of his own. The correct balance should be taken with a *loaded* magazine, as in big bore pistols, this makes a material difference.

The absolute essentials are a tight fit to the belt, a hard inflexible solid back that cannot wobble on the belt, a close-fitting sheath and a cover flap that can be pulled open in one movement and that rises quite clear of the pistol. For an open holster the essentials are the same, less the covering flap, but the wings of the sheath would project rather high to keep dust clear of the weapon.

Open holsters can be worn on the belt (Sam Browne) as well as flap ones, but in this position they offer no material advantage over the closed flap military pattern. Continental officers and police carry the pistol in a holster slung on a strap, bandolier fashion, but it is not a convenient method nor peculiarly practical. The best of all is the usual Mexican or American way with the open holster down on the thigh, as when in the saddle, this shifts conveniently round behind, and the weapon is ready as the hand drops down on to the butt instinctively. No pistol with more than a six-inch barrel can be carried in this way by a mounted man.

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CHAPTER VIII

THE SELECTION OF A PISTOL

THE selection of a pistol depends upon the purpose for which you require it and the amount you are prepared to pay. In every case the best pistols are comparatively high priced, but there is no doubt that they are worth the extra charge because they are so much better and more satisfactory.

This rule applies when buying revolvers as well as automatic pistols, and it is as well to remember that an indifferent automatic that jambs is more dangerous than an indifferent revolver, for the cheap revolver is comparatively simpler and much more reliable than the cheap automatic. It seldom jambs, and even if it misfires the next chamber can be discharged before a fraction of a second has elapsed. When an automatic jambs the action has to be cleared by hand and time which might be of vital importance, is lost.

A reliable revolver can be bought for under a couple of pounds. It will not be a first-class target weapon, but it can be depended upon to shoot, and shoot moderately straight, when required. Most automatics that are sold for two pounds or less are essentially unreliable, and to be perfectly candid only the best makes can have any faith reposed in them.

The arms made by the B.S.A., Colt's, Webley's, and Savage arms companies stand absolutely pre-eminent. Among the Continental makers F.N. (Browning), Mauser, Mannlicher, the Fabrique d'Arms Française de St. Etienne and Bayard are good, and the Luger-Parabellum pistol can be certainly included. Outside these it is very much a matter of luck, sometimes a reliable batch of pistols is turned out, usually they are hopeless.

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The Continental pistols, as a whole, are less reliable than the American and British arms, and are turned out more cheaply and with less finish in order to sell at a lower price. The exceptions to this are the military models, which are made, as a rule, to standard Government specifications and are not "cheapened" to meet a popular market. The Parabellum pistol used by the Germans is a good instance of this. It is decidedly well made, well finished, and good material, and it is not a low-priced arm.

This book is meant to survey the subject of automatic pistols, and I have judged the Parabellum as a pistol without being prejudiced by its nationality, but I hope and trust that my readers among the Allies will not purchase these weapons or other pistols of German or Austrian make when much better weapons made by the Allies are to be easily had. On the other hand, a number of enemy pistols are now in the hands of officers and men of the Allied forces, who have acquired them by the conquest of their original owners. This is quite sufficient excuse for including them in this book.

For a military automatic a calibre of ·400 or more is essential, as the smaller calibres lack stopping power despite their high velocities. It is my personal opinion that the ·45 Colt Government model is the military pistol upon which one can rely most. It can now be had chambered to take the ·455 *automatic* service cartridge (not the ordinary revolver cartridge) issued to the Navy, but this cartridge compares badly with the ·45 auto. As alternative, there is the Webley ·455 self-loading pistol, Navy model, which is awkward to grip owing to its big square handle.

A new range of ·400 automatics are now being tried for military purposes, and the post-war models are obviously better than existing types, as they embody the latest ideas and practice on the subject.

So far as pre-war weapons are concerned, my personal

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preference is for the Colt, though the Webley is an accurate and hard-hitting weapon quite suitable for slow target practice.

The intermediate sizes are suitable for, say, exploration trips in savage countries where it is not desired to carry a weapon as bulky as the ·45.

The Webley 9 mm. is an excellent model and would be my choice in preference to the small calibre Luger-Parabellum despite the fact that the latter has a very handy slanting grip.

In pocket pistols Colt, Savage, and Webley have little to choose between them. I personally would select a ·380 Savage and a ·32 Colt as either weapon fits well in the pocket and can be easily drawn.

In vest pocket pistols there is again little difference, either the ·25 Colt or the ·25 hammerless Webley would suit me excellently. The Mauser ·25 is rather large but very accurate.

The selections above are arbitrary, they are my own personal points of view, and are determined on the following plan—

1. What shape of stock among these pistols under consideration is the best natural fit in the hand?

2. Which weapon balances best and can be comfortably carried in a holster or pocket so that when I drop my hand to it the grip comes naturally into my grasp.

3. Are there any awkward or disadvantageous peculiarities of sighting, or clumsy, easily forgotten safety catches about any of them?

4. Do I know from experience that any of them are prone to jambs?

5. Can I get cartridges for them anywhere in civilized parts?

6. Is ammunition for them particularly expensive?

7. Are they easy to clean and easily dismounted and put together?

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8. Hammer or hammerless types, which is the best for my purpose ?

9. Considerations of weight or size.

The points that are not worth worrying about with first-class weapons are their accuracy and the question of ammunition. Good weapons by good firms, and good cartridges by good makers can be relied upon to do their work. Comparative values of velocity and energy for the various cartridges can be looked up in the tables of ammunition ballistics, and are useful in deciding questions of what calibre and charge will serve your purpose, but are no use in helping you to choose a pistol. As a sound rule, it is wise to remember that the heavier the charge the less likelihood there is of jambing, for the more powerful cartridges have a higher margin of efficiency.

At a good shooting gallery a novice can obtain practice with any make of pistol, and a wide choice of arms is usually accessible at the gallery. (In London, King's Range, in Oxenham Street, just next to the Prince of Wales Threatre, and in Paris, Gastinne Rennette, 39 Avenue d'Antrin, Champs Elysées, will serve your purpose.) It is wise to try various makes before you make your decision, and then, having chosen and purchased your arm, stick strictly to practise with that alone until you have got used to it.

The foregoing pages will have given you a rough knowledge of the various makes and types of automatic pistol, and the rest can be learnt only by experience. A book cannot teach you to shoot or even teach you to choose a pistol wisely, but it can provide you with advice, give you details of weapons and explain why certain things are good or bad, as the case may be.

The experience and knowledge of weapons that goes to the writing of a book of this nature, condensed and limited as it may be, is the outcome of many years' keen personal interest and study of pistols and pistol

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shooting. It can help you to acquire the same knowledge, but it can only be a guide, and like all guides, it is not free from the personal element. I believe certain things in pistol matters and have my own ideas on their importance. For instance, I believe that quick shooting is more important than accurate target work, a theory that may be a heresy to the slow target shot of the old school. These and kindred personal preferences you will have to test and decide upon for yourself. Some people like sugar in their tea, some do not, just so some people like square-handled automatics, some prefer slanting, or natural grip ones. It is a matter of personal choice.

In the main I believe my views to be shared by most expert shots and shooting men. The comment and letters I received after the publication of my previous work (*The Book of the Pistol*, McBride, Nast & Co.), was very representative and almost uniformly complimentary. This book has been written with a scrupulous disregard of what manufacturers say about their own wares, and is an attempt to give the novice a little disinterested advice about automatic pistols and to appraise the various models and makes offered from the buyer's rather than the seller's point of view.

There is a certain amount of criticism in it, and criticism is a salutary thing that spurs manufacturers on in their endeavour to produce the absolutely ideal pistol. There is also praise when it is due, for a good pistol of good workmanship and design deserves much praise for it is a thing much harder of accomplishment than most people realize.

It is impossible to find a pistol that is at once a military weapon, a target weapon, and a pocket pistol. It may be a good target weapon and a military pistol, or it may be a pocket pistol and very accurate for target work, but the ideal all-round pistol is yet to be made, and cannot be made until a new ammunition is

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discovered which will be capable of being fired in a military arm small and light enough to go in the pocket, and will yet possess enough shocking power to be reliable as a soldier's arm.

For a target pistol there is, at the time of writing, only one choice, the ·22 Colt target automatic. It fires cheap reliable ammunition and is an excellent weapon, but it is to be hoped that other first-class manufacturers will soon put a competitive target model on the market.

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CHAPTER IX

AMMUNITION AND BALLISTICS

THE modern cartridge is most carefully devised by experts, who work out a series of calculations to estimate the best weight of bullet, amount of powder, type of cap or primer, and every detail of shape of projectile and nature of the materials used in the bullet and case.

The manufacturers carry out an exhaustive series of experiments to find what gives the best results, and the end of their research is that the ammunition provided for a particular calibre of weapon is exactly what that weapon works best with. In fact, in most cases the weapons are designed to suit the ammunition rather than the ammunition designed for the weapon.

A good rule to go on is to use the ammunition made by the firms recommended by the makers of the weapon. For instance, Belgian F.N. cartridges suit a Browning pistol a little better than American ones of a similar calibre. Colts work at their best with Winchester, or U.M.C. cartridges, Webleys with Kynochs or Eleys.

There is only the faintest difference between the cartridges of all first-class makers. A good pistol will work, to all intents, as well with American, British, or Belgian cartridges of the same size, but usually the cartridge of the country of origin is very slightly the better for the pistol made in that country.

Automatic cartridges are always *rimless*, that is to say, they have no rim like the usual rifle or revolver cartridge, but have a recess cut round the base for the extractor to engage in. (Cartridges with projecting rims tend to jamb in a magazine as the rims catch in one another, being of greater diameter than the rest of the cartridge.) They are loaded with smokeless

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powder which does not foul and does not need internal lubrication, and they have nickel, copper, or steel-jacketted bullets which will stand high velocities which would cause a plain lead bullet to strip in the barrel, and are not deformed by the thrust which pushed them from the magazine into the chamber. Of all metallic-jacketted bullets, steel-cased bullets with a light coat of nickel steel are the best. The cupro-nickel cases tend to leave too much metallic fouling and plain steel cases rust in moist atmospheres.

For sporting purposes soft-nosed bullets are supplied, these have the core of lead that is inside the nickel case projecting at the point. Such bullets expand, or mush-room, very much more than the fully-cased ones when they strike a soft body, producing greater shock with an equivalent loss in penetration. Their use in warfare is forbidden, and anyone found with such bullets in his possession is very properly liable to (and usually gets) trial forthwith, and is promptly shot.

The powder charges of smokeless cartridges vary very much. This is because smokeless, unlike black powder, is not constant, different batches from the same maker give different results. The system of loading is simple. Samples are taken from each batch of powder and tested; the cartridges are then loaded not with a specific measure or weight of so many grains, but with the exact amount needed to give the standard velocity of that particular cartridge. In other words, modern cart-ridges are not loaded to a formula but to a standard result. Before being put on the market the cartridges are well tested and one can rely upon ammunition by first-class makers being absolutely sound in every respect.

The modern smokeless cartridge is designed to develop a certain pressure on the base of the bullet all the time that it is in the barrel. To this end the powder is cut in tubes, threads, grains, or flakes, which burn at a certain speed, and the aim is to impart a gradually

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increasing velocity to the bullet so long as it is in the barrel and to have completely burnt up all the powder just as the bullet leaves the muzzle. In practice this theory is not realized, and there is a good deal of waste energy, but this has no effect upon the bullet's flight after it has left the muzzle. This blast, or back pressure of expanding gases, also serves to operate the weapon, for it exerts a pressure on the nose of the barrel and the front surface of the slide. In machine-gun practice this is utilized by the designers, but it is not usually taken into calculation with pistols.

If an automatic cartridge is opened it will be found incompletely filled with powder or rather lightly packed. This is as it should be, for a certain amount of air-space is necessary for the charge to develop under the best conditions.

It is extremely dangerous to tamper with automatic cartridges by hammering the bullet farther into the case and compressing the charge. It is likely to cause excess chamber pressures far higher than the pistol will stand, and imperils the life of the person using it.

The following tables will give the loads, velocities, and striking energies of automatic cartridges at various ranges. They vary slightly according to the make of cartridge, and the loads are, of course, variable, still they serve for purposes of comparison. The automatic usually has a very high muzzle velocity, but it loses this very quickly, and up to the present the ordinary English service revolver cartridge ·455 is the more powerful at the usual range. The smaller calibres of automatic conversely give better results than the smaller revolvers.

Despite all theory, the experience of years has shown that the heavier and bigger the diameter of the ball the greater the shock effect on animal bodies. For instance, the high velocity light ·30 Luger bullet will pass clean through, but not stop, an animal, where a

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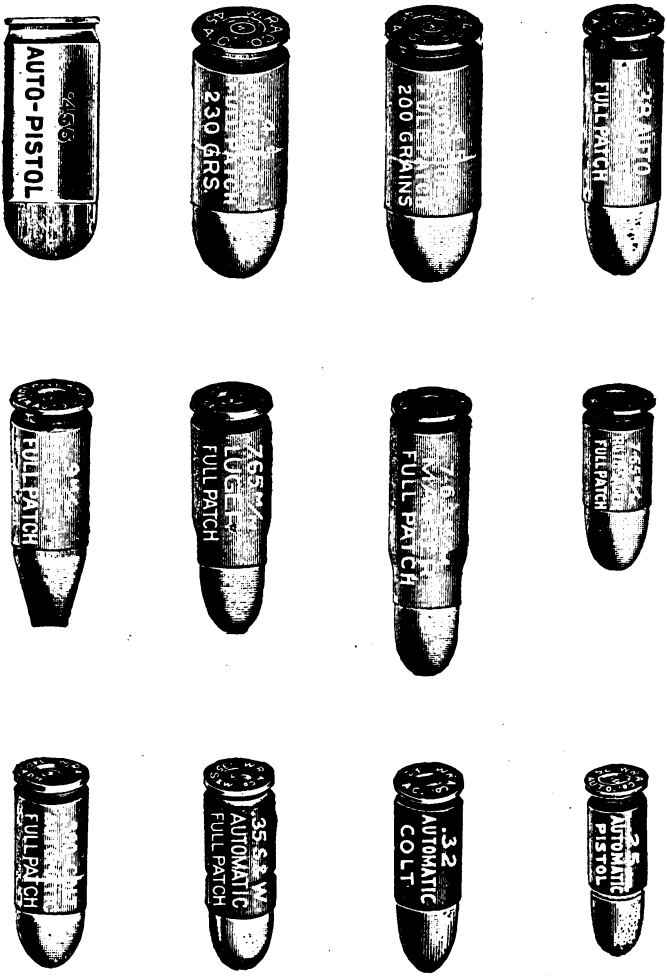
PLATE XI



Modern Automatic Pistol Cartridges.

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·38 revolver bullet of lower velocity will bring it down. Until velocities of pistol bullets can be increased to a point where explosive effects can be obtained with a normal light-weight projectile, big calibres must be maintained.

With the present nickel-cased high velocity bullets no calibre less than ·400 is of use for service purposes, the smaller ones lack stopping power. A blow with the butt end of a scaffolding pole will knock you over where the same blow delivered with the same force, but with a thin steel rod, would merely run you through without necessarily paralysing your power of attack, unless it hit a vital spot. The same applies to small calibre bullets.

BALLISTIC TABLES OF AUTOMATIC CARTRIDGES.

WINCHESTER CARTRIDGE CO. COLT PISTOLS.

Cartridge.	Barrel.	Lgth. Brrl.	Muzzle Velocity.	Muzzle Energy.	Penetration, $\frac{7}{8}$" Bead.
	Grs.	In.	F.S.	F.Us.	
·25 (6·35 mm.)	50	2	733	59·7	3
·32 (7·65 mm.)	74	$3\frac{1}{4}$	938	144·8	5
·380 (9 mm. short)	95	$3\frac{3}{4}$	887	166	$5\frac{1}{2}$
9 mm. Long Militia	ry—not	given.			
·38	130	6	1175	398	10
·45 Colt	200	5	910·2	368	8
·Govt. model	230	5	809·0	335	6
·455 British auto—	not give	n.			

ELY CARTRIDGE (PISTOL UNSPECIFIED).

Cartridge.	Wgt. of bullet.	Lgth. of Brrl.	At 50 yds. M.V.	Energy.	At 50 yds. Veloc.	Energy at 50 yds.
·25	50	Not	650	47	610	41
·32	75	given	950	150	895	133
·380 (9 mm. short)	95	,,	900	171	850	152
9 mm.	110	,,	1,070	280	1,005	247
·38	128	,,	1,100	344	1,035	304
·45 Colt	200	,,	830	306	780	270
·455 British auto	224	,,	710	250	680	230

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KYNOCH CARTRIDGES (PISTOL UNSPECIFIED).

Cartridge.	Weight of Bullet.	M.V.	Not given.
·25	50 qrs.	600 p.s.	
·32	72 ,,	900 ,,	
·9 mm. long	110 ,,	950 ,,	
·38	130 ,,	1,000 ,,	
·455 British auto	224 ,,	710 ,,	

OTHER BALLISTICS (VARIOUS SOURCES).

Luger-Parabellum, 7·65 mm. (·301"), m.v. 1,150 p.s. Energy, 266 ft. lb.

Mauser 7·63 mm. (·300)
m.v., 1,340. Energy, 339 ft. lb.
At 50 yds. V. 1,165 ,, 256 ,,

The ·455 Service *Revolver* bullet weighs 265 grs. m.v. 750 f.s = Energy, 331 ft. lb. at 50 yds.
At 50 yds. it has v. 714; energy, 300 ft. lb.
7·65 mm. Bergmann. Muzzle velocity, 1,250 ft. per sec.
6·35 mm. ,, ,, ,, 675 ,,
5· mm Charola ,, ,, 950 ,,
9 mm. Parabellum, 5 grs. powder, 125 gr. bullet, m.v. 1,039 yds.
9 mm Steyr Mannlicher, 6·3 ,, 116 ,, ,, 1,150 ,,

For further tables see Appendix.

An entirely new set of automatic pistol cartridges are now in preparation. These will have a belt round the case designed to prevent any possibilities of jambs caused by interlocking of the rim flanges. The calibres will be seven, nine and probably eleven millimetres, but for these sizes no great increase of muzzle velocities over existing cartridges need be anticipated. The new belted cartridges are at the moment experimental, but they will soon be on the market and reduce all earlier cartridges to a comparatively obsolete standard.

In the same way pistols firing non-belted ammunition liable to jamb will also be obsolete.

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CHAPTER X

TARGET AUTOMATICS AND THE FUTURE AUTOMATIC PISTOL

THERE is so far only one target automatic on the market. This is the ·22 Colt, but doubtless this will be followed by others owing to the great popular demand for such a weapon.

The Colt ·22 auto is a splendid little pistol, up to date in every particular. It has a good slanting handle giving a genuine grip in place of the square handled abomination beloved of salesmen who do not shoot. It is hammerless and has a ten-shot magazine.

The barrel is 6½ in. long and fixed, and is a departure from the previous Colt characteristics in that it is not covered by the slide, the total length of the weapon is 10½ in., the weight, 28 oz.

The sighting is excellent, a bead foresight capable of elevation by means of a screw, and a rear sight laterally adjustable for windage. Distance between sights, 9 in.

The cartridge is the ·22 long rifle rim-fire externally lubricated cartridge, and either smokeless or "Lesmok," must be used, as black powder does not suit the arm. The ammunition is extraordinarily cheap and easily obtainable.

The pistol is equipped with a grip safety and a slide safety, and the breech side is easily removed for cleaning.

The magazine holds ten shots, and is easily loaded, for it has a side button for depressing the platform and spring as in the Parabellum. The trigger-pull is particularly free and sweet for an automatic, and the whole arm is essentially reliable and accurate. Jambs are hardly known, and the weapon is in every way a credit to its designers.

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The limits to its killing power when used on small game must be realized, for the charge is not a powerful one when it is considered that it has to work the action as well as driving the bullet, and has a short barrel as well, but for target use it is extraordinarily efficient and provides an excellent practice weapon. It should, however, be remembered that it is a third again as powerful as any of the ·25 automatic cartridge pistols.

Later it is to be hoped that the large calibre pistols will be made on the same graceful lines, so that practice with the ·22 model will train the hand for practice with the larger bores. In any case it is to be hoped that progressive makers will follow the excellent example in design of pistols for natural shooting that is set by this, the latest automatic pistol on the market.

Webley and Scott make a *semi*-automatic single-shot target pistol in ·22 calibre which is modelled on their 32 pocket pistol. It is not a repeater or self-loader, and is made in 4½ or 9 in. barrel length and can be fitted with a shoulder stock. It is provided with a hand ejector as well as an extractor and chambers all the ·22 rim-fire cartridges.

It is not a particularly useful pistol, as it possesses most of the disadvantages of a square handled automatic without any compensating advantages over a decent well-designed single shot ·22 target pistol.

The Germans use a ·22 ordinary pistol, built to resemble the external shape and lines of the Parabellum as nearly as is convenient with the mechanism. It is known as the "Pfenninger," is inexpensive, accurate, and good for practice in automatic shooting with the Parabellum type.

The conditions of practice between the firing of the usual automatic and the single shot ·22 vary so widely that practice with the latter is not of much use as regards gaining an expertness with the former. On the other hand, the saving in ammunition is so great,

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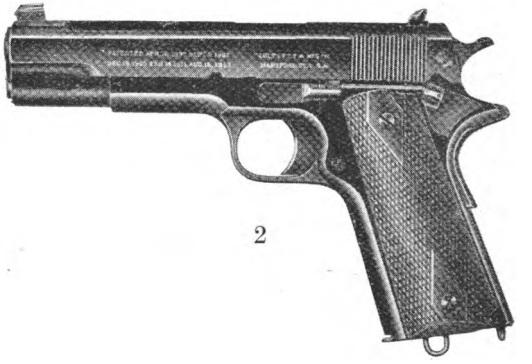
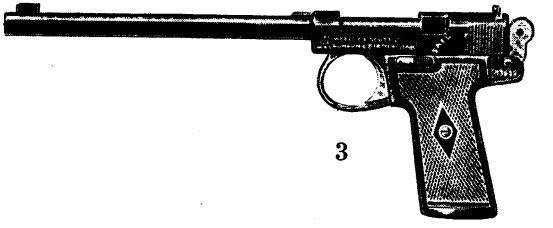
PLATE XII

Target Pistols

1



2



3

1. ·22 Target Colt. 2. ·45 Colt fitted Target Sights.
3. Webley-Scott ·22 Semi-automatic Target Pistol

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and the advantages of practice of any kind so marked that some shots believe in ·22 practice as a preliminary to the more serious weapon. Apart from this it is very pleasant to be able to indulge in unlimited practice with a very cheap cartridge like the ·22, for most pistol ammunition is by no means cheap. The ·22 is also fairly safe to use in districts where open-air practice with the bigger calibres might not be safe.

The Bisley meeting of the National Rifle Association has been suspended since 1914 and the ranges are used for training the men of the New Armies. Previous to this Bisley was the great annual event, and Bisley rules were the criterion of all rifle and revolver competition work.

Very few competitions were open to automatic pistols as well as revolvers, and still fewer were limited to automatic pistols alone.

The rules of Bisley were framed to encourage military revolver shooting, and weapons of other than the standard military calibre of ·45 were inadmissible. As automatics developed the rules were in some cases amended to permit of their inclusion, but most competitions still insist upon a large calibre being used.

The rules specify—

Calibre—Maximum, ·44 in. Minimum, ·22 in.
Sights—Any, but must be affixed to the barrel.
Pull of Trigger—Minimum, 4 lb.

Any ammunition may be used provided that the makers of that particular pistol have given the required guarantee to the N.R.A. Council that the weapon is suitable for use with the full load as specified by the N.R.A.

Colts, Webley's, Gastinne Renette and Messrs. Smith and Wesson (in respect of their "New Bisley Model" revolver only) have given this guarantee.

The position of other weapons should be regularized

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by communication with the N.R.A. before any attempt to enter with them in competition should be entertained.

The position of Bisley after the war will probably be very much changed, and it is to be hoped that competitions for " all military automatics " and for " small calibre pistols " will be arranged, in order to stimulate the production of good reliable accurate arms and establish a competitive standard which will furnish a sound popular basis of comparison.

The Whitehead competition is for service teams of eight men, and admits automatic pistols of not less than ·44 calibre.

The " Duelling " is open to all comers, and allows any automatic. Six shots at a 5 ft. 8 in. figure target appearing at 3 secs. intervals for 3 secs. at 33 yards.

The " Granet," another figure target competition at 33 yards, is for any automatic pistol of ·455 or ·450 calibre.

The " Webley Automatics " is confined to Webley revolvers or automatics of not less than ·455 calibre.

This mean list covers the competitions in which an automatic pistol might be used in 1914, but, it is to be hoped that the future will admit of an extension of the competitions in order that the latest modern weapons may gain as much from Bisley as did their predecessors, the military revolvers.

The 1919 " Victory " Bisley showed a distinct advance in the theory of pistol shooting as a six second maximum time for figure targets was compulsory. Future Bisley's will, it is hoped, further accentuate the importance of speed pistol shooting at the shorter ranges, but a settled programme has yet to be evolved.

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PLATE XIII

Bergmann. Target Pistol with special set-trigger and adjustable front and rear sights; 7 mm. cartridge 5 shot clip loading Magazine.

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CHAPTER XI

ANALYSIS, CRITICISM AND SPECULATION

In calculating some of the simpler functions of an automatic pistol there are many more factors to be taken into account than in the relatively simple action of a single-shot pistol of equal calibre. In a locked breech type of automatic there are, again, many more points to be considered than in the relatively simple blow-back patterns.

In the latter the inertia of the breech slide plus the power needed to overcome the pressure of the recoil spring must be sufficient to allow the bullet to travel through the barrel and release the powder gases into the atmosphere before the breech begins its backward movement. In addition to this it must be remembered that the internal pressure of the powder gases while the bullet is in the barrel is pressing the walls of the cartridge case into close frictional contact with the chamber.

This pressure furnishes a third source of resistance, and is one of the reasons why high-powdered cartridges containing a greater store of energy are unsuitable to blow-back mechanisms, and have to be met with a locked breech system in which the breech bolt is secured to the barrel during the moment of firing. In a blow-back mechanism, with such a cartridge, the thrust of powder gases upon the head of the case and the retractive effort of the breech-block extractor would lead to a burst or broken case and consequent jambing of the mechanism. This very fault was not uncommon in the earlier pattern machine guns, but with a more swiftly burning powder and progressive design, the need for integrally-locked breech mechanisms in pistols of calibres up to ·400 is vanishing.

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Taking the average barrel velocity of a projectile as about three-quarters of the muzzle velocity, it is easy to calculate the time employed by the travel of the bullet from chamber to muzzle.

In a 3½-in. barrel with a muzzle velocity of 860 f.s. the distance is entirely accomplished in ·00045 of a second, this being the rate of travel at 650 f.s. average velocity.

The ideal breech block design provides for an absorption during this fraction of time, of sufficient energy to function the weapon. This energy is stored up in the recoil spring and in overcoming the inertia of the breech bolt or slide, and should be sufficiently in excess of the essential minimum power required, so that it can deal with an unusually recalcitrant case or chamber a slightly distorted cartridge. On the other hand, it should not have an excessive over-supply of energy so as to avoid giving the frame an unnecessarily powerful blow at the end of its stroke.

The belief that all the recoil of an automatic pistol is absorbed by the working of the mechanism is entirely erroneous. Sufficient of the recoil energy is stored in the spring to work the mechanism, the bulk of the remainder is transmitted to the frame and the arm of the firer by the blow of the recoil slide at the end of its stroke, while minor quantities are absorbed in friction.

The factors to be taken into account in the recoil functioning are the weight of moving parts, the distance they have to move, and the pressure of springs to be overcome. Springs in automatics are normally in a state of compression, and the movement of the breech does not raise the spring from zero to maximum compression but from initial compression to maximum.

The amount of energy needed to compress the spring can be estimated by taking the mean force of the spring between its normal state of compression to its maximum with the breech fully retracted.

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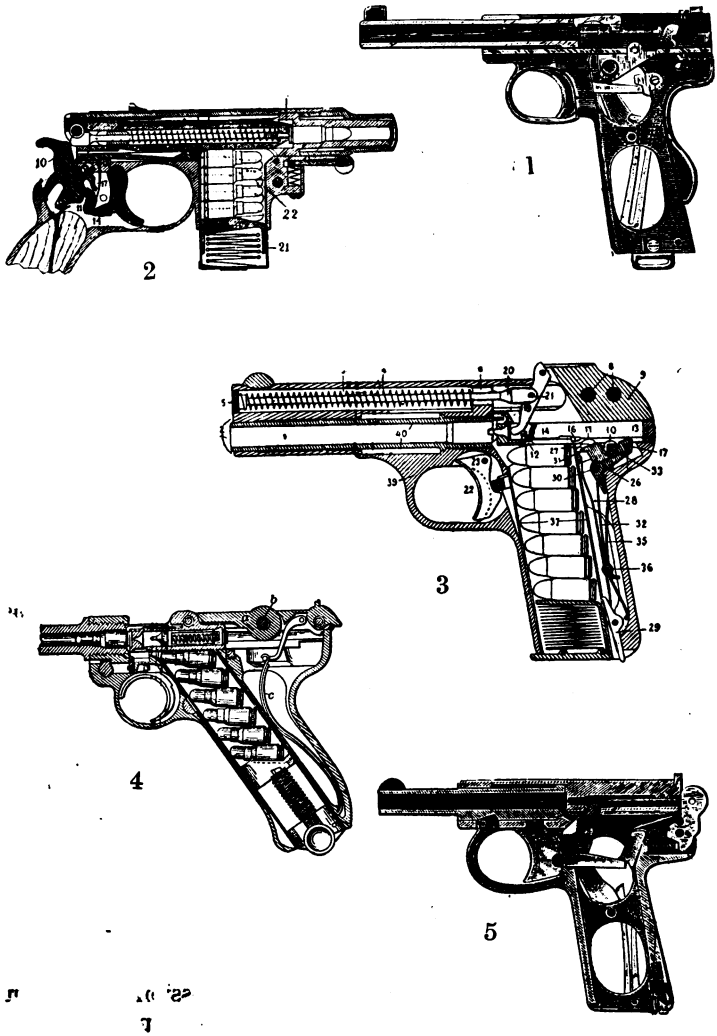
PLATE XIV

Sections of Mechanism



1. Webley ·38 H.V. Hammerless.
2. Bergmann Military Model.
3. Old Model Browning ·32.
4. Parabellum-Luger.
5. Webley ·32 Pocket.

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This in the Savage pistol is 12 lb. normal, 16 lb. at full compression, giving a mean of 14 lb. The distance travelled is 1·4 in., so 14 lb. multiplied by 1·4 and divided by 12 gives the value of 1·63 foot lb., the energy needed to be stored in the spring to accomplish its return stroke. In practice 3 per cent. of the total energy of the cartridge is all that is necessary for the reloading and cocking operations.

Recoil is the reaction of bullet impulse, and these two forces are equal and opposite. Therefore, if we take the bullet weight in lbs. multiplied by the muzzle velocity in ft. secs. we get the units of momentum of the bullet. This result, divided by the weight of the pistol, gives us the velocity of the recoil in ft. secs.

Weight of pistol multiplied by velocity of recoil squared, and divided by 64·4, gives us the energy of recoil in foot pounds.

Taking the Savage ·380 as an example and following the formulae—

$w \times V = m$ — w = weight of bullet in lbs., ·0136. V = 860 f.s. m = 11·7 units of momentum.

$\frac{m}{W} = v$ — This divided by W, the weight of pistol 1·35 lb., gives v, the recoil velocity of the pistol 8·7 f.s.

$\frac{W \times v^2}{2g} = E$ — $\frac{1{\cdot}35 \times (8{\cdot}7)^2}{2 \times 32{\cdot}2}$ (g is a constant, 32·2). E, the energy of recoil, comes out as 1·59 ft. pounds.

This result has been attained by taking W as the whole weight of the pistol. This raises the point of whether recoil should not be calculated upon the weight of the moving parts alone. In mechanisms where the barrel moves part of the way the barrel is included as a recoiling part although its travel is quickly arrested.

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In this particular example the weight of the recoiling parts is ·5 of a lb., giving 23·4 f.s. of recoil, or 4·25 foot pounds.

In practice what occurs is as follows: The 4·25 ft. lb. of recoil are imparted by the charge to the moving parts. The recoil spring and the cocking of the hammer absorb what they require (in this case the spring takes up 1·63 ft. lb.) and the remainder of the momentum is transmitted in the form of a blow to the frame, which is absorbed in the shooter's arm. The energy absorbed by the spring is then expended in returning the breech and reloading the arm.

Muzzle energy is estimated by the formula—

$$\frac{W\ V^2}{2g} = E$$

W = the weight of the bullet in pounds multiplied by the muzzle velocity squared, and divided by 64·4.

In the case of a ·25 calibre automatic cartridge W is ·00714 lb. × 740^2 ÷ 64·4. Muzzle energy, 60·7 ft. lb.

The values of the various automatic loads vary slightly as made in different weights of bullet by different manufacturers, but the standard accepted values are as follows—

Calibre.	Weight in lbs.	Weight in grs.	M.V. f.s.	M.E. ft. lb.
·25	·00714	50	740	61
·32	·01071	75	990	152
·35 S.W.		76	800	108
·380	·0136	95	860	156
·45	·0286	200	860	360
·455	·03143	220	780	300

7,000 grs. = 1 pound.
1 grain = ·0001428 of a pound.

The analysis of automatic pistol data paves the way for a consideration of the main points that a modern high power automatic should possess, and elucidates the reasons why some pistols are unsatisfactory. Also

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certain factors emerge such as the fact that all the best makes follow certain fixed ratios of proportion such as about 7½ ft. lb. of energy to each ounce weight of the pistol, the velocity of the breech-block slide is damped down by weight and springs to a speed of about 20 ft. per second, the striker should have a blow equivalent to one-fifth of a foot pound. Besides these there are also to be considered all the various mechanical devices and refinements that progressive manufacture has introduced.

The great difficulty met within the design of large calibre automatics such as the ·450 is the excessive recoil produced by the high bullet weight. Smaller bore pistols of equivalent velocity or those that impart even a higher energy to the bullet have less recoil. This is because momentum varies with velocity while energy varies with the square of the velocity.

The big momentum value needs heavy recoiling parts to balance it, and the mechanical difficulties of construction mount rapidly as the 9 mm. calibre is passed.

There is no doubt that the automatic will eventually supersede the revolver for all purposes, and that we were justified in expecting a great advance in design which will render the weapons reliable and efficient for all purpose.

But at present the main faults of modern military automatics are the square handle stupidity, and the numberless opportunities for sand and mud to drift into delicate slide recesses. Some pistols seem designed to afford special opportunities for foreign bodies to enter the action and even the Colt, which is about the best of the batch, does not seem to be free from reproach in view of the following letter reprinted from *Outdoor Life*, March, 1917.

EDITOR "OUTDOOR LIFE": I notice often in *Outdoor Life* that some of the readers and "gun-crank" correspondents seem to be so enthused over the class of pistol that are automatic. I would like to say a few words on the subject, with the only wish that it may be of some help to anyone contemplating the

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purchase of a revolver or pistol to take on a hunt or trip into the wilds.

I was fortunate (?) enough to be a non-commissioned officer in a cavalry regiment during the recent long, stern-end chase after Villa, a chase that took us over some terrible mountain ranges of the Sierra Madres and some inhospitable deserts of the state of Chihauhau, Mexico.

We were armed, besides our sabres and Springfield rifles, with the new Army model ·45 automatic pistol. Ask any soldier who rode through that terrible ride that Col. Dodd engineered, and who really wanted and needed his side gun, what disgusting results we experienced with the automatic pistol.

After a thirty-mile ride through clouds of alkali dust, at least nine out of ten pistols were found useless, without a thorough taking apart and cleaning of the mechanism; and this was the weapon we were supposed to use in cavalry charges! I suppose everyone knows that we quickly got rid of our useless sabres early in March. I remember seeing sabres ornamenting the trails daily in Mexico up till May, when an official order from the Army Department ordered the various cavalry regiments in Mexico to discard the sabre.

Cavalry charges are usually made on the spur of the moment, at some crucial time in a fight. I was in one such charge. Until we mounted up and the charge was sounded, no one gave any thought to his pistol. Then it was too late. I know my own gun, and others also, refused to work, and I simply rode along without anything to fight with.

I have also often taken my automatic from its flap-covered holster, taken the cloth wrapper (soldier's invention) from it—a dangerous way to carry a gun in a hostile country—and endeavoured to take a snap shot at a prairie owl or a coyote. Result—the going off of the gun was so doubtful that you were sometimes alarmed at its report.

While in the Philippines we were armed with the Colt New Service, a splendid revolver, and how we sighed for them in Mexico!

Now, a gun for a man who rides the deserts, through dust, through streams; a gun that you can lay around and still draw and shoot quickly when the occasion demands, is the only gun that a real hunter or plainsman wants to pack around with him. There is an old saying here in the West: "When a man needs a gun he needs it bad." For gallery work or for shooting in a nearby lot that is nice and clean and free from dust the automatic pistol may do very well, but for the trail, the woods, the dusty deserts and plains of the Southwest, the old-style revolvers still hold good.

They have one good feature—they shoot when you expect and need them to do so. The automatic pistols have one serious defect for a man of the wilds—they may go off, but it is doubtful.

California. FRED CLARK.

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Similar experiences with all types of large calibre automatic have been frequent on all fronts during the present war. The marked need, then, is for a ·450 or ·400 calibre sloping or pistol-handled automatic, with all moving parts inclosed as far as possible. Ease of dismounting might even be sacrificed to this greater essential, but the combination of both virtues is not incompatible.

In pocket pistols the ·22 long rim-fire cartridge offers great opportunities. It is cheaper, easier obtainable, and more powerful than the ·25 and only requires a slightly longer frame and stroke than the normal vest-pocket weapon. In target, pocket, and vest pocket sizes the bulk of the component parts could be standardized and a wide range of pistols produced from the same reproduction machines.

The design of pistols is largely determined by the handle magazine and therefore by the dimensions of cartridge employed. Whether the limit of energy-values has been reached in nitro powders or whether a new and denser form of propellant could be evolved affords an interesting field of speculation. If such a charge could be realized, the shorter cartridge would afford a welcome reduction in the general bulk of the weapon and the limited stroke of the recoiling parts could be dealt with more easily.

The lessons of the past would seem to indicate that eventually a compromise between the extremes of ·450 and ·5 mm. calibres will be arrived at, possibly by a new treatment of bullet cores which will provide for greater deformation upon impact with soft bodies without passing the limits of a legitimate service projectile.

The latest class of small and intermediate bore sporting rifle depends for its effect on game at close ranges on the fact that a light nickel-covered pointed projectile with a *very* high velocity tends to " burst " or expand with explosive effect.

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This effect is produced by the resistance of the tissues to the spin of the bullet, and the effect is produced in three separate phases, but these only occupy fractional parts of a second and are, so far as their outward manifestation is concerned, simultaneous.

First the bullet moving at high velocity penetrates a short distance into the tissues. The higher the velocity the greater the resistance, so the tissues check the ultra high velocity bullet, and secondly, it ceases to spin regularly upon its axis and begins to "keyhole." Thirdly, so soon as it keyholes, it presents greater surface and the resistance of the tissues again mounts destroying the gyroscopic stability of the bullet. With this the bullet yields up its store of energy by bursting into pieces just as would a suddenly-checked high velocity engine fly-wheel.

These effects are particularly noticeable in the latest small bore rifle cartridges, such as the ·22 high power, with 3,103 f.s. velocity and a 90 gr. bullet. The energies of this rifle are given as—

Energy at muzzle	1,921 ft. lb.
100 yds.	1,660 ,,
200 ,,	1,445 ,,
300 ,,	1,247 ,,

Obviously these results cannot be obtained from any cartridge suitable for a pistol, but it is not inconceivable that in the future a very high velocity combined with a light bullet of low calibre may give us a load whose actual effect upon an adversary will be equivalent to the shocking power of the present ·450 at all normal pistol ranges. The Japanese are at present reported to be experimenting with a pistol of 6·5 mm., which weapon may turn out to be the forerunner of the new military automatics.

During the last stages of the war, the automatic pistol was used by the Germans as a supplementary

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PLATE XV

Special 32-shot magazine fitted to standard 9 mm. Parabellum pistol. (War trophy, 1918.)

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machine gun. They increased the magazine capacity of the Parabellum to thirty-two rounds by the ingenious device of a snail magazine. These drums contain a powerful spring which forces the cartridges round the groove of the drum up the straight magazine shaft to the chamber feed.

They are difficult to load by hand and were supplied in sets of six with a little lever loading tool to each box. Though designed for use with the long barrelled Parabellum with shoulder stock, they were served out as an accessory to the ordinary short-barrelled service pistol and proved extremely useful.

Supplementary to the pistols were special Bergmann automatic carbines using the same cartridge and the same drum magazines. Thus the last stages of the war showed a tendency to abandon the long range magazine rifle in favour of short-ranged automatic shoulder carbines and pistols. Such weapons will probably be the great feature in small arms in the next great war.

The course of pistol development throughout history has always been a pendent to the progress of its large brother, the rifle. The underlying principles of design and ballistic efficiency are materially the same for both arms, but the pistol is confined to narrower limits of range recoil and general utility because of its small size. Interesting and attractive as digressions in specialized types of pistol, such as the small bore target arm may be, one should never lose sight of the real criterion of a pistol's value. It must be a *weapon*.

In combat the pistol is the last resource, the last device, and it is called upon when artillery, machine gun, bomb, and rifle fire have alike failed and man is about to struggle with man in personal conflict.

In that last moment there is no place for theoretical excellencies. Man requires a reliable weapon upon which he can stake his life and be certain that he will be truly served. The war pistol must be an absolutely reliable,

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handy, and well-balanced arm of proved stopping power, capable of enduring active service conditions without breakdown and certain in its functioning. So far as automatic pistols of to-day are concerned this ideal weapon has yet to be designed.

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APPENDICES

TABLES.

Millimetre Sizes in Inches.

10	mm.	·3937 inches.
9	,,	·3543 ,,
7·80	,,	·3170 ,,
7·65	,,	·3016 ,,
7·63	,,	·3008 ,,
6·35	,,	·25 ,,
5	,,	·1968 ,,

EARLY PISTOLS.

Schlegelmilch	Magazine Pistol	1891
Konrad Kromars	Semi-automatic	1892
Borchardt	"Prometheus" Model	1893
Bergmann	Automatic	1894
Mannlicher	Semi-automatic	1894
Maxim	Experimental	1895
Schwarlose	Automatic	1896
Bergmann	,,	1897
Simplex	,,	1898
Mauser	,,	1898
Mannlicher	,,	1898
Browning	,,	1898
Parabellum Luger	,,	1902
Colt	,,	1903
Roth	,,	1903
Clair	,,	1903
Mars	,,	1903

Note.—Kromar developed into Mannlicher.
Bergmann absorbed in Modern Bayard.
Mauser continues.
Borchardt absorbed in Luger-Parabellum.

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TABLES.

Actual Bullet Sizes (Automatics).

Nominal Calibre.	Exact Calibre.
·45	·4505
·455	·4550
·38, ·380 or 9 mm.	·358
·32 or 7·63 mm.	·3008
·25 or 6·35 mm.	·25
·35 S. & W.	·3195

Millimetre Sizes in Inches.

10	mm.	·3937 inches.
9	,,	·3543 ,,
7·80	,,	·3170 ,,
7·65	,,	·3016 ,,
7·63	,,	·3008 ,,
6·35	,,	·25 ,,
5	,,	·1968 ,,

Conversion Weights.

1 grain = ·0001428 lb.
7,000 grains = 1 lb.
1 grain = 0·0648 grammes.
1 ounce = 437·5 grains = 28·350 grammes.
1 pound = 16 oz. = 453·6 grammes or 0·4536 kilos.
1 gramme = 15·432 grains or 0·0352 oz.
1 Kilogramme = 1,000 grammes = 35·274 ozs. = 2·204 lbs.
Feet × 3048 = metres.
Metres × 3·2809 = feet.
Foot pounds × 13825 = kilogram-metres.
Kilogram metres = 7·233 = foot pounds.

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TABLE FOR VELOCITY AND ENERGY OF A BULLET OF 100 GRAINS. BASED ON FORMULA.

$$E = \frac{W \times V^2}{29}$$

Velocity in feet per sec.	V^2.	Energy in foot lbs.	Difference in W lbs.
1,500	2,250,000	499	
1,475	2,175,625	432	17
1,450	2,102,500	466	16
1,425	2,030,685	450	16
1,400	1,960,000	434	16
1,375	1,890,625	419	15
1,350	1,822,600	404	15
1,325	1,755,625	337	15
1,300	1,690,000	374	15
1,275	1,625,625	360	14
1,250	1,562,500	346	14
1,225	1,500,625	332	14
1,200	1,440,000	319	13
1,175	1,380,625	306	13
1,150	1,322,500	293	13
1,125	1,265,625	280	13
1,100	112,000	268	12
1,075	1,155,625	256	12
1,050	1,102,500	244	12
1,025	1,050,625	233	11
1,000	1,000,000	221	12
975	950,625	210	11
950	902,500	200	10
925	355,625	189	11
900	810,000	179	10
875	765,625	169	10
850	722,500	160	9
825	680,625	150	10
800	640,000	141	9
775	600,625	133	8
750	562,500	124	9
725	525,625	116	8
700	490,000	108	8
675	455,625	101	7
650	422,500	93	8
625	390,625	86	7
600	360,000	79	7
575	330,625	73	6
550	302,500	67	6
525	275,625	61	6
300	250,000	55	6

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Table for Velocity and Energy—(*contd.*)

Example.—	50 gr. bullet	at V. of	725,	energy.
From Table.—	100 ,,	,,	725 =	116 ft. lb.
∴	50 ,,	,,	725 =	58 ,,

Example.—	200 gr. bullet	at V. of	900,	energy.
From Table.—	100 ,,	,,	900 =	ft. lbs.
∴	200 ,,	,,	900 =	358 ,,

The standard of comparison for a military automatic pistol is the Service Revolver. Lt.-Col. P. W. Richardson, V.D., gives the following ballistic data for the ·455 Service Ammunition, Mark II.

Bullet weight, 267 grains. Ballistic co-efficient about 0·2.
Striking energy with 7½″ barrel, about 262 ft. lbs. at 100 yards.
Extreme Range, 1,550 yards at a barrel angle of 35°.

M.V.	7½″ barrel.	6″ barrel.	4″ barrel.
	720	670	600

Drop in feet of bullet below line of sight—

	7½″ barrel	6″ barrel.	4″ barrel.
20 yds.	·11	·12	·16
50 ,,	·7	·78	1·0
100 ,,	2·8	3·2	4·0
200 ,,	11·2	13·0	16·0

For efficient war practice a good shot should be able to hit a stationary man twice out of three shots at 100 yards, and at 200 yards once out of three shots.

The new military automatics are supposed to be capable of killing at 500 yards and capable of accuracy to 200 yards.

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BALLISTIC TABLE OF AMERICAN LOADED CARTRIDGES

(HIMMEL WRIGHT).

Cartridges.	Exact Calibre.	Nominal Powder Charge.	Weight of Bullet in Grains.	Length of Barrel.	Muzzle Velocity in feet per Second.	Muzzle Energy in Foot-pounds.	Penetration in inches of White Pine.	Remarks.
·22 Short	·223	1·6	30	6	789	41·5	3	Lesmok powder used. The fulminate charge also contributes a propellant effect.
·22 Long	·223	2·1	35	6	770	46·2	3½	
·22 Long Rifle	·223	3·4	40	6	765	51·8	4	
·25 Auto	·251	1·1	50	2	733	59·7	3	
·32 ,,	·3125	2·5	74	3¾	938	144·8	5	
7·65 mm. Parabellum	·3095	4·1	93	4⅝	1173·5	284·3	11	Powder charge in grains of Bull's-eye Powder. Note the low figure of the S. & W. cartridge and the close performance of the ·38 and the 9 mm. Parabellum. The variation of the ·45 load is also of interest.
7·63 mm. Mauser	·3105	5·5	86	5½	1397	373·0	11	
·35 S. & W.	·3195	1·9	76	4	706·3	108·6	4	
·380 Auto	·357	2·6	95	3¾	887	166·0	5½	
9 mm. Parabellum	·355	4·6	125	4	1039·2	299·8	10	
·38 Auto	·359	4·6	130	6	1175	398·0	10	
·45 Colt Auto	·4505	4·7	200	5	910·2	368	8	
·45 ,,	·4505	4·7	230	5	809	335	6	
·455 Auto, Webley	·455	7	220	5	750	280·6	4½	Cordite Powder.

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BALLISTICS FROM VARIOUS SOURCES

(METRIC VALUES).

Pistol.	Calibre.	Weight of Bullet.	Estimated Muzzle Velocity.
Charola-Anitua	5 mm.	— grammes	310 metres per sec.
Bergmann	6·35 ,,	— ,,	225 ,, ,,
,, Model, 1895 . . .	6·5 ,,	— ,,	400 ,, ,,
,, ,, 1896 . . .	7·70 ,,	— ,,	400 ,, ,,
,, ,, 1899 . . .	8 ,,	5·5 ,,	400 ,, ,,
,, ,, 1899 . . .	8 ,,	5·70 ,,	320 ,, ,,
Roth ,, 1900 . . .	8 ,,	7·5 ,,	260 ,, ,,
,, ,, ,, . . .	7·65 ,,	5·5 ,,	295 ,, ,,
"Mars" or Gabbett Fairfax { 1900 .	11·4 ,,	14·2 ,,	367 ,, ,,
,, .	9 ,,	10·3 ,,	500 ,, ,,
,, .	8·5 ,,	9 ,,	503 ,, ,,
Hamilton	6·5 ,,	10·40 ,,	228 ,, ,,
Frommer	8 ,,	10·40 ,,	278 ,, ,,

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ANALYTICAL TABLE OF AUTOMATIC PISTOL DATA

COMPILED FROM "ARMS AND EXPLOSIVES," 1916.

Type.	Calibre.	M.V. in in f.s.	Units of Momentum.	Recoil Velocity of Moving Parts.	Recoil Energy.	Weight of Moving Parts.	Spring Absorbtion.	Full Compression.	Stroke.
Savage	·380	860	11·7	23·4 f.s.	4·25 ft.lbs.	·8 oz.	1·63 ft.lbs.	16 lbs.	1·4
Colt	·45	860	24·6	24·6 ,,	8 ,,	1·7 ,,	2 ,,	13 ,,	2·12
Webley	·455	780	24·5	24·5 ,,	6·3 ,,	16·1 ,,	2 ,,	13 ,,	1·8
Browning ·32 New Model	·32	990	10·60	24 ,,	3·97 ,,	7·1 ,,	·88 ,,	13 ,,	·95
Smith and Wesson	·35	800	8·53	44 ,,	5·42 ,,	2·9 ,,	1·6 ,,	22 ,,	1⅛
Old Browning	·32	990	10·60	—	—	9·2 ,,	—	12 ,,	1¼
Schwarzlose	·32	990	10·60	11·9 ,,	—	14·2 ,,	—	—	1·2
Mauser	·25	740	5·28	19·2 ,,	1·39 ,,	2·69 ,,	·59 ,,	6 ,,	1·3
Bayard Military	9 mm.	1,134	20·6	20·6 ,,	1·9 ,,	11·2 ,, barrel 4·3 ,, bolt	·81 ,,	8½ ,,	1·5
Steyr, Pocket	32	990	10·6	51·5 ,,	8·5 ,,	3·3 ,,	·86 ,,	10 ,,	1·48

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CONTINENTAL POCKET MODELS

	Bayard.	Walther.	Steyr.	Steyr.	Dreyse.	Venus.	Mauser.	Old Model Browning.	
Weight with Magazine empty	450	320	605	330	650	330	425	625	gramme
Overall Length	12	11	16	11·5	16	12	16	16·3	cms.
Calibre	7·65	6·35	7·65	6·35	7·65	6·35	6·35	7·65	mm.
Number of Cartridges in Magazine	6	7	8	7	7	7	9	7	
Weight of Bullet	4·8	3·20	4·8	3·20	4·8	3·20	3·20	4·8	gms.
Weight of Powder	·2	·06	·2	·06	·2	·06	·06	·2	,,
Initial Velocity							228	270	metres per sec.

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ENGLISH AND AMERICAN LARGE MODELS

Colt U.S. Government.	Webley Self-loading.	Colt Military.	Webley, High Velocity	Webley Hammerless Military	
Weight with Magazine empty .	39	36	38	31	32 oz.
Overall Length	8½	8½	9	8	8 inches.
Calibre	·45	·455	·38	·38	9 mm.
Number of Cartridges in Magazine	7	7	8	8	8
Weight of Bullet . . .	200	224	128	128	110 grains
Weight of Powder . . .					
Initial Velocity	830	710	1,100	1,000	1,005 feet per sec.

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LARGE CONTINENTAL MODELS

	Mauser.	Large Browning.	Borchardt.	Luger-Parabellum.	Bergmann, 1897.	Mars.	Roth.	Bergmann.	Mannlicher. 1901.	Clair.
Weight with Magazine empty	1·180	·865	1·275	·835	1·125	1·307	—	·850	·810	1·300 kilogrammes
Overall Length . . .	290	225	190 (Barrel only)	237	275	300	200	250	221·5	440 mm.
Calibre	7·63	9	7·65	7·65	7·65	8·5	8	6·5	7·65	7·7 mm.
Number of Cartridges in Magazine . .	10	7	8	7	10	8	10	6	8	6 rounds
Weight of Bullet . .	5·5	8·95	5·5	6·00	5·5	9	7·5	5·3	5·53	7·9 grammes
Weight of Powder . .	05·	·03	·045	·033	·030	·0648	·023	·016	·022	·0315 grammes
Initial Velocity . . .	435	340	400	350	400	533	260	235	230	259 metres per sec.

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MODERN ENGLISH AND AMERICAN POCKET MODELS

	Colt Pocket.	Savage.	Webley M.P.	Browning New Model.	Vest Pocket Colt.	Vest Pocket Hammerless Webley	Bayard.	Vest Pocket Hammer Webley.	Vest Pocket Browning F.N.	
Weight with Magazine empty	23	19	18	20	13	9½	—	11	13½	oz.
Overall Length	6¾	6½	6¼	6	4½	4½	—	4¾	4½	inches
Calibre	·32	·32	·32	·32	·25	·25	·380	·25	·25	,,
Number of Cartridges in Magazine	8	10	8	7	6	6	6	6	6	rounds
Weight of Bullet	74	74	74	74	50	50	93	50	49	grains
Weight of Powder	3½	3½	3½	3½	1½	1½	4	1½	1½	,,
Initial Velocity	938	950	900	950	733	600	887	650	733	feet per sec.

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THE END

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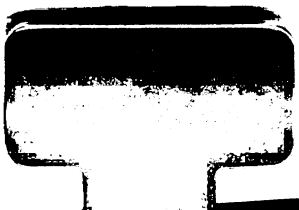

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